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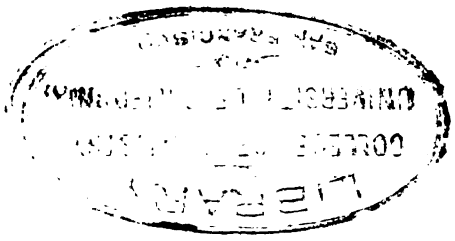
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A MONTHLY MAGAZINE OF DENTAL ART, SCIENCE AND LITERATURE

VOLUME XXXVI
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EDITOR
R. OTTOLENGUI, M.D.S., D.D.S., LL.D.

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The Inauguration of a Serious Effort to Establish a System of Education for Dental Hygienists.

In September last we published an illustrated description of the office building and offices of Dr. A. C. Fones, of Bridgeport, and stated that future historians would point out this building as the place in which the first training school for dental nurses had come into existence. It is with pleasure that we open the 1914 volume of ITEMS OF INTEREST with the announcement that this venture has been successfully started. It may be of interest to future students of this subject to set down here the true origin and scope of this enterprise.

Dr. Fones has long been known as an ardent advocate of the advantages of mouth hygiene. He tested the possibilities first in his own practice, and during the last two years has made frequent exhibits of patients who had been in the care of his assistants and himself for periods of various lengths, and all the practitioners who visited Bridgeport to inspect these mouths, returned to their homes converted to the theory, or at least admitting that, "there is something in it." This latter class, however, were few in numbers, and confined to those who are irrevocably opposed to the "dental nurse," even though compelled reluctantly to admit the value of the work that she might do. For in Dr. Fones's office they saw gums that had been diseased restored to health; and gums that never had been diseased so improved in color,

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tone, and beauty, that they compared with ordinary tissue, as the most cultivated chrysanthemum compares with the daisies of the field.

Effort for School Clinics.

Having proven the advantage of this system in private practice, Dr. Fones became inspired to extend it for the benefit of the community, by applying it in the public schools. He believed that the great and baneful tide of dental caries could only be stemmed at its source, and that in this connection at least the axiom should read, "An ounce of prevention is worth ten thousand pounds of cure," a logical deduction from which would be that one properly managed prophylactic school clinic, would do more for the children and for the townspeople, than forty curative dental clinics, however meritorious these latter might be.

To test out this theory, he urged the authorities of Bridgeport to appropriate money, and to grant permission for the establishment of a prophylactic school clinic. But, unfortunately, the Board of Education included a dentist as one of its members, and this man was not only appointed to the school clinic, but was made chairman of the committee. Every man is entitled to hold opinions, and, of course, this gentleman had the right to have his own views on the subject of school clinics. Unfortunately his ideas and those of Dr. Fones did not harmonize, and consequently Dr. Fones resigned from a committee brought into existence mainly through his efforts, and to do this just when he had hoped to see this prophylactic experiment seriously tested by application in a public school, was a grievous disappointment not only to Dr. Fones, but to all who are watching his efforts.

The great majority of men, similarly placed, would have abandoned a project received with so little appreciation and comprehension, but Dr. Fones is not of the character that is easily discouraged. Indeed, when facing the situation thus brought about, he finally concluded that it was possibly just as well that the experiment had been postponed; "postponed" is the only word he would use. Had the clinic been started with the September school term, it would have been difficult to find properly educated women to undertake the care of the children. Hence he decided to begin again, and to begin from a new starting point; to begin by properly educating a class of women who might then be relied on as really competent "trained dental nurses."

Nurse, Hygienist, or What?

Dr. Fones then concluded to invite the co-operation of the highest grade of competent teachers, who should donate their services for a single year, not only in training the women, but likewise, if possible, to establish a curriculum or system of educa-

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tion for this class of dental worker. Thus this "school" is not at present expected to continue after this year; and, indeed, even if a training school of this character should become a permanent fixture in Bridgeport, it is manifest that it cannot be conducted with the present staff of lecturers. That the course, therefore, might have a more permanent influence than the mere education of a single class, Dr. Fones decided to record all the lectures stenographically, and after proper revision, to have these lectures published in book form as a foundation for a system of training of dental nurses.

We say "dental nurses," because that term is best known at present in dental world, but in all his talks with medical teachers, to whom he outlined his plans, Dr. Fones met with strenuous objection to the term "dental nurse." Medical men and trained medical nurses all oppose the term as a misnomer. Studying this aspect of the problem and finally concluding that these women, thus educated, must eventually be something more than merely workers in the mouth; that they, indeed, must themselves become educators, educating first the patients passing through their hands; and secondly, educating other similar workers by assuming places as teachers in training schools, Dr. Fones finally decided to call the members of this first class, "trained dental hygienists."

But however objectionable or unsatisfactory the term "dental nurse" may be, it does not seem to the writer that the term "dental hygienist" quite supplies the need. When these women take their place finally in the great band of workers for the salvation of individual and public health, it hardly seems possible that the name "dental hygienist" or "dental prophylacticist" would be as easily adopted and comprehended as the commoner term "dental nurse."

This is a digression, but it may not be amiss to register a passing thought here. Let us imagine the extreme fruition and universal adoption of this method of attacking unhygienic mouth conditions. New York City alone would require at least three thousand trained women for its public school prophylactic clinics, whereas not more than one thousand would find places in private offices. The three thousand would be working with and upon children, many of immature minds. These "kiddies" have already learned to take their physical troubles to the "medical nurse." Will it not be easier to teach these youngsters the meaning of the term "dental nurse," than to train them to carry their dental aches and pains to a "hygienist" or to a "prophylacticist," and is it not primarily for the infant citizens that this new army of workers is being enlisted?

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The Inauguration of the Fones School.

Dr. Fones's indefatigable efforts to obtain a teaching staff, finally resulted in the subjoined notable list. When it is remembered that these men have joined forces, not to form a faculty of a medical, or of a dental college, but solely for the purpose of experimentally training a small band of women, who shall go out into the world as the pioneers of a great work, the importance of the men and their willingness to give of their time for the possible betterment of the health of little children, makes this list of names most impressive. The following men have agreed to lecture in the Fones School for the Education of Dental Hygienists:

Lecture Staff.

Raymond C. Osburn, Ph.D., Professor in Barnard College, Columbia University, New York City.

Yandell Henderson, Ph.D., Professor of Physiology, Medical Department of Yale University.

Alexander M. Prince, M.D., Instructor in Medicine and Physiology, Medical Department of Yale University.

L. F. Rettger, Ph.D., Assistant Professor of Bacteriology, Sheffield Scientific School of Yale University.

R. H. W. Strang, M.D., D.D.S., Bridgeport, Conn., Specialist in Orthodontia.

Dr. George M. MacKee, Instructor in Dermatology, College of Physicians and Surgeons, New York City.

Edward C. Kirk, Sc.D., D.D.S., Dean of Dental Department, University of Pennsylvania.

Eugene H. Smith, D.M.D., Dean of Dental Department, Harvard University.

M. L. Rhein, M.D., D.D.S., New York City.

R. G. Hutchinson, Jr., D.D.S., New York City, Specialist in Treatment of Pyorrhea Alveolaris.

R. Ottolengui, M.D.S., New York City, Editor of ITEMS OF INTEREST.

Chas. M. Turner, M.D., D.D.S., Professor of Mechanical Dentistry and Metallurgy, School of Dentistry, University of Pennsylvania.

Russell H. Chittenden, Ph.D., L.L.D., ScD., Director of Sheffield Scientific School of Yale University.

M. I. Schamberg, M.D., D.D.S., New York City, Specialist in Oral Surgery.

Herman E. S. Chayes, D.D.S., New York City.

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C. Ward Crampton, M.D., Hygienist and Director of Physical Training, Public School System, New York City.

Professor Irving Fisher of Yale University, Chairman of Committee of One Hundred on National Hygiene.

Dr. William G. Anderson, Professor and Director of Yale University Gymnasium.

Thaddeus B. Hyatt, D.D.S., New York City.

Alfred C. Fones, D.D.S., Bridgeport, Conn.

Lecture Course.

The following epitome of the lecture course will give some idea of the curriculum and scope of teaching which has been planned for the class:

1. *Anatomy.*—By Raymond C. Osburn, Ph.D., Professor of Barnard College, Columbia University, New York City.
2. *Physiology and Visceral Anatomy.*—By Yandell Henderson, Ph.D., Professor of Physiology, Medical Department of Yale University, and Alexander M. Prince, M.D., Instructor in Medicine and Physiology, Medical Department of Yale University.
3. *Bacteriology and Sterilization.*—By L. F. Rettger, Ph.D., Assistant Professor of Bacteriology, Sheffield Scientific School of Yale University.
4. *Anatomy and Histology of the Teeth and Jaws. Nomenclature.*—By R. H. W. Strang, M.D., D.D.S., Bridgeport, Conn., Specialist in Orthodontia.
5. *The Skin in Health and Disease* (also giving a Brief Outline of Symptoms and Diagnosis of Chicken Pox, Small Pox, Measles, Scarlet Fever, etc.).—By Dr. G. George M. MacKee, Instructor in Dermatology, College of Physicians and Surgeons, New York City.
6. *Oral Secretions. Deposits and Accretions of the Teeth.*—By Edward C. Kirk, Sc.D., D.D.S., Dean of Dental Department of University of Pennsylvania.
7. *Dental Pathology.*
   - (*a*) *Dental Caries.*—By Eugene H. Smith, D.M.D., Dean of Dental Department of Harvard University.
   - (*b*) *Alveolar Abscess and Odontalgia.*—By M. L. Rhein, M.D., D.D.S., New York City.
   - (*c*) *Pyorrhea Alveolaris.*—By R. G. Hutchinson, Jr., D.D.S., New York City, Specialist.
   - (*d*) *Malocclusion.*—By R. Ottolengui, M.D.S., Editor of ITEMS OF INTEREST.

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8. *The Teeth as a Masticating Machine.*—By Chas. Turner, M.D., D.D.S., Professor of Mechanical Dentistry and Metallurgy, School of Dentistry, University of Pennsylvania.
9. *The Chemistry of Food and Nutrition.*—By Russell H. Chittenden, Ph.D., L.L.D., Sc.D., Director of Sheffield Scientific School of Yale University.
10. *Oral Surgery That Might Have Been Prevented by the Dental Hygienist.*—By M. J. Schamberg, M.D., D.D.S., New York City, Specialist in Oral Surgery.
11. *The Sanitary Aspect of Dental Operations.*—By Herman E. S. Chayes, D.D.S., New York City.
12. *Hygiene.*
    (*a*) *Factors in Personal Hygiene.*—By C. Ward Crampton, M.D., Hygienist and Director of Physical Training, Public School System, New York City.
    (*b*) *Posture and Fresh Air.*—By Professor Irving Fisher of Yale University, Chairman of Committee of One Hundred on National Hygiene.
    (*c*) *Lengthening the Life of the Resistive Forces of the Body.*—By Dr. William Guilbert Anderson, Professor and Director of Yale University Gymnasim.
13. *The Teaching of Mouth Hygiene to School Children.*—By Thaddeus B. Hyatt, D.D.S., Brooklyn, N. Y.
14. *The Psychology of Handling Children.*—By Edward C. Kirk, Sc.D., D.D.S.
15. *Dental Prophylaxis.*—By Alfred C. Fones, D.D.S., Bridgeport, Conn.

One or two lectures will be added to the course later.

The first meeting of the class occurred on the evening of November 13, 1913. Dr. Fones has converted his beautiful garage into a remarkably fine lecture room. The floor is covered with crash. At one end is a platform with aluminum surface screen for lantern projections, and the lecturers have at their service, a lantern, in connection with which they may use regular lantern slides, microscopic specimens, or solid objects or prints. The students have large, comfortable chairs, each with table arm for use in making notes.

At this first meeting of the class addresses were made by Drs. A. C. Fones, E. S. Gaylord, M. L. Rhein, and R. Ottolengui.

It had been intended to limit the class to thirty, but the number was increased to thirty-two in order to accept applications from teachers who are connected with the Bridgeport public schools. The following is a list of the members of this first class:

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Members of Course for Dental Hygienists.

Miss Ruby Boerum .....Bridgeport, Conn.
Miss Enid Cortright (with Dr. A. C. Fones).....Bridgeport, Conn.
Miss Blanche Darling .....Bridgeport, Conn.
Miss Carolyn Frederick (with Dr. L. E. Sage).....Bridgeport, Conn.
Mrs. Allen Ganung (with Dr. T. A. Ganung).....Bridgeport, Conn.
Miss Rena Hubbell .....Bridgeport, Conn.
Miss Rose House (Vis. Prin. Bridgep't Pub. Sch.)...Bridgeport, Conn.
Miss Flora Harlow (Teacher Bridgep't Pub. Sch.)...Bridgeport, Conn.
Miss Maude Hugo (with Dr. R. H. W. Strang).....Bridgeport, Conn.
Miss Lillian Kerr (with Dr. D. B. Hawley).....Bridgeport, Conn.
Miss Florence Harris .....Bridgeport, Conn.
Miss Hazel Lockwood .....Bridgeport, Conn.
Mrs. Haviland Robinson .....Bridgeport, Conn.
Miss Gladys Reilly (with Dr. W. J. McLaughlin)....Bridgeport, Conn.
Mrs. Hubert Hart (Regist. Nurse in Pub. Schools)..Bridgeport, Conn.
Mrs. Irene Newman (with Dr. A. C. Fones).....Bridgeport, Conn.
Miss Grace Lyon (with Dr. Geo. Fahy).....New Haven, Conn.
Miss Edna Lassen (with Dr. A. W. Crosby).....New Haven, Conn.
Miss Madeline Sinclair (with Dr. D. W. Johnston)..New Haven, Conn.
Miss Edmere Champagne (with Dr. E. R. Bryant)..New Haven, Conn.
Miss Louise Borchardt .....Waterbury, Conn.
Miss Louise Rich (with Dr. C. E. Gates).....Waterbury, Conn.
Miss A. K. Moores (with Dr. J. D. Hertz).....Stamford, Conn.
Miss Mary Russell (with Dr. O. T. Rule).....Stamford, Conn.
Miss Mary Harrington (with Dr. J. L. Loftus).....Meriden, Conn.
Mrs. J. L. Loftus (with Dr. J. L. Loftus).....Meriden, Conn.
Miss Louise Birdsall (with Dr. A. W. Costeles).....Hartford, Conn.
Miss Clara Harris (with Dr. A. W. Crosby).....New London, Conn.
Miss Bessie Proctor.....New York City, N. Y.
Miss Sarah Stewart (with Dr. N. A. Estes).....Newport, R. I.
Miss Maude Sullivan .....New Milford, N. Y.
Miss Ruby Guilbert .....Milford, Conn.

Of this class, Dr. Fones writes as follows: "There will be about fourteen or fifteen of these women open for engagements after the first of June, but I would like to keep six or seven for Bridgeport if I am able to secure an appropriation for a prophylactic dental clinic."

In addition it may be added, that a movement is on foot which, if successful, will engage the services of two or three of these trained women in a prophylactic clinic projected for the public schools of one of New York's smaller cities, where it is hoped that a test of this kind can be successfully carried through.

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In addition to the lecture course, the class is to have practical work, beginning on manikins, such as have been devised for use in dental colleges, and later including actual work in the mouth.

Dr. Fones merits the gratitude of the profession for his arduous and self-sacrificing labors to test the value of the services of women trained to give prophylactic care to the human mouth.

A New Gospel and an Appeal for Higher Art in Amalgam Fillings.

By William R. Pond, D.D.S., Rutland, Vermont.

Since the appearance of Dr. Young's article, "*Restoration of Occlusion by the Casting Process,*" and of Dr. Ottolengui's papers and editorials on the same subject, it would seem useless on the part of another to dwell, more than briefly, on the very obvious advantages of this line of procedure in filling teeth, over the older method of flat, polished occlusal surfaces. The idea of restoring correct tooth forms and proper occlusion by fillings, is bound to appeal to the progressive dentist, and in reading and considering the convincing evidence in its favor he can only wonder why it was not thought of before. It does not seem credible that the only man who puts a proper valuation on normal occlusion and things relating to it, is the orthodontist, nor do I believe this to be the case. Controversy is bound to come, but it is safe to predict that this will only tend to strengthen a theory which is so obviously correct, as the dogma that we should restore proper tooth forms and proper occlusal surfaces in our filling work.

Why have we, for years, tried to carve proper tooth forms and occlusion in our crown and bridgework and rightly ridiculed the "umbrella ferrule" gold crown, and why have we so recently called for "anatomical teeth" for platework and done so much with anatomical articulation? Because we recognize advances when we see them. We must recognize the same points in our filling work, and I believe we will. All steps in advance, all new ideas, all improvements, meet with resistance and stir up controversy and ridicule; but things which are fundamentally, theoretically and mechanically correct are, like true character, only strengthened by resistance and made more secure by adverse criticism.

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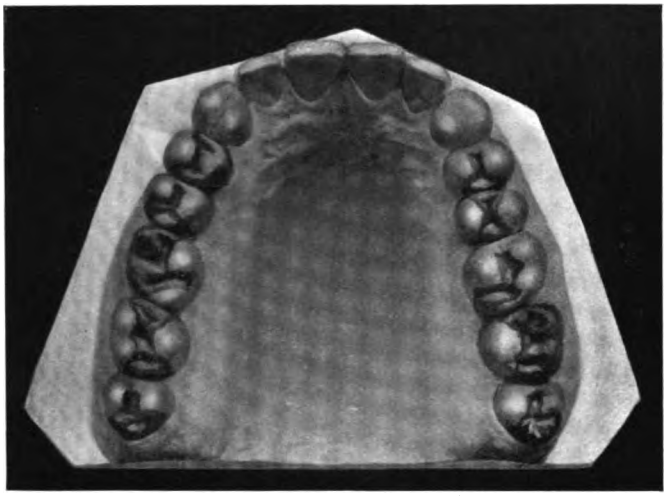


Fig. 1.

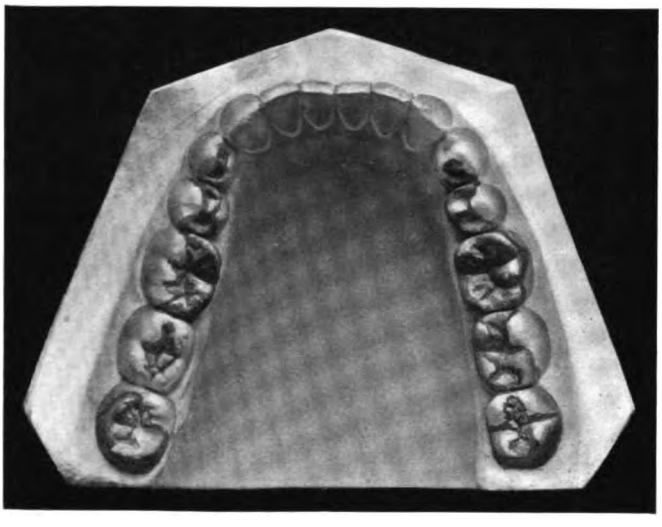


Fig. 2.

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To use a homely comparison: time was when the sporting journals were rife with articles on the relative merits of breech and muzzle loading guns. There was as much argument against the breech loaders as for them; but what was mechanically correct and in line with true progress was the more quickly adopted by reason of the controversy. Do sportsmen now use muzzle loading guns? Decidedly not. So it will

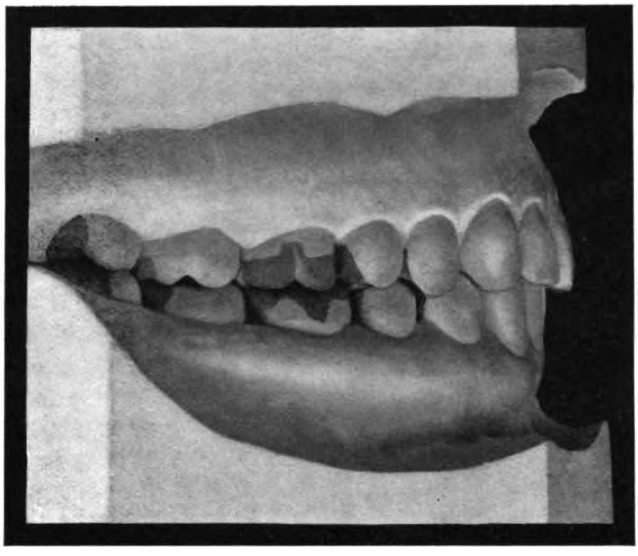


Fig. 3.

be with *our* progress; the things which are fundamentally correct are bound to survive, and among these things will be found the basic principles in filling work set forth in Dr. Young's article on *"Restoration of Occlusion by the Casting Process"* and in Dr. Ottolengui's editorials supporting that article.

The Cast Gold Inlay Versus Amalgam.

So far let us agree with what is so clearly right regarding the necessity of restoring tooth forms, and as far as possible, normal occlusion in our filling work. But is it always necessary to resort to the cast inlay in order to attain this desirable result? We are told in Dr. Young's article, in Dr. Ottolengui's writings on the subject, and in the reports and discussions of numerous others, that in order to restore correct occlusal surfaces in our filling work we *must* use the cast gold inlay. This statement is somewhat arbitrary and I think could be better modified to read, "the work *may* be done by the use of the cast gold inlay."

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There is no denying the results obtained with the cast gold inlay, but how about amalgam work? Must this great filling material be thrown into the scrap heap? Are the men who prefer to use amalgam and the men who must use amalgam to feel that they are only putting in substitute fillings at best; fillings that are so inferior that they should not be there at all? Decidedly the amalgam filling should not and will not go out of use. What, then, should be done about it? The answer is plain. Raise the standard of amalgam work until this filling is fit to stand beside its brother, the gold inlay.

If we admit that in order to make a good restoration the filling must be carved to reproduce the natural occlusal surface, clearly we must carve amalgam. One of the principal objects of this paper is to show that amalgam may be carved. If this can be done and if correct approximal contact points can be secured, what can be said against these fillings, except from the standpoint of aesthetics? Granted, that the gold restorations are more pleasing to the eye, where else is their advantage over amalgam? Surely not in any tooth-saving property exerted by the gold in the filling, for the inlay is cemented in, and this feature may also be added to the amalgam restoration. May we not say that amalgam, correctly used, has, in some cases, distinct advantages over the gold inlay? The fact that these fillings may be inserted and finished at one sitting must appeal in some cases, as does the lessened wear and tear on patient and operator and the lessened expense to both. I have seen inlay cases where a temporary filling was inserted between appointments, after cavity preparation, where the tooth was in such a state of irritation that it hardly seemed advisable to cement in the inlay. This surely is a condition to be avoided, especially in young patients.

Description of Illustrations.

In order to demonstrate the possibilities of this class of work, I made occluding models of a good set of teeth, in good occlusion, and carved numerous cavities in the plaster teeth. I then restored these teeth with amalgam, carving the masticating surfaces as nearly in imitation of normal as I could. These restored models I used in a table clinic at the last meeting of the Northeastern Dental Society. Figs. 1 and 2 show the occlusal surfaces of these two casts, and Fig. 3 the profile view of the side which contains the largest fillings. These models have been much commended, but the criticism has been made that while such carved amalgam restorations might be possible on plaster casts, such results could not be expected when working in the mouth, with the probability of having the amalgam crushed out of shape during the first twenty-four hours. It is for this reason that I have prepared this description of the technique of making amalgam restorations of occlusal surfaces, and I will now offer a few examples from actual cases.

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The following illustrations have been obtained by taking impressions of finished work in the mouth and making casts therefrom. The region occupied by the amalgam fillings were then colored with India ink wash and the casts photographed.

Fig. 4 shows casts of the left upper and lower molar region of the mouth of a patient whose lower first molar was badly wrecked. The

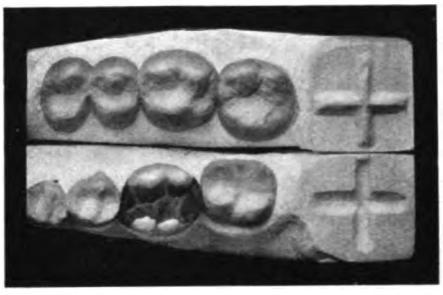


Fig. 4.

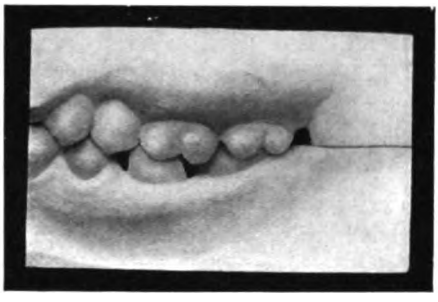


Fig. 5.

restoration is seen to include the mesial, distal and morsal surfaces. The cusps of all the teeth are seen to be extremely long; consequently the lingual cusp of the upper first molar requires an extremely deep central fossa in the lower molar for its reception. Fig. 5 shows the two casts occluded, and we note the great depth of the overbite. As the cusps of the opposing molars interdigitate perfectly, the carving of the amalgam must have been correct. Thus the function of these teeth have been fully restored, a result which is impossible where the amalgam is simply smoothed off with wet cotton, as is so often done.

Fig. 6 shows casts of the upper and lower teeth on the right side of another case. Amalgam restorations are noted in the second upper molar and in both upper bicuspids. The first upper molar is a gold shell crown, and whilst it is very much better than the average of

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stamped crowns, its rounded cusps and sulci renders it easily detected when compared with the adjacent teeth. In the illustration of the lower teeth we observe almost a complete tooth (lower first molar) restored with amalgam. There is also a carved amalgam restoration in the second molar. Fig. 7 shows these two casts as they appear when occluded.

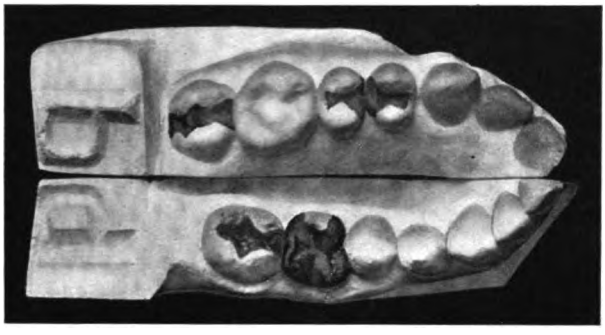


Fig. 6.

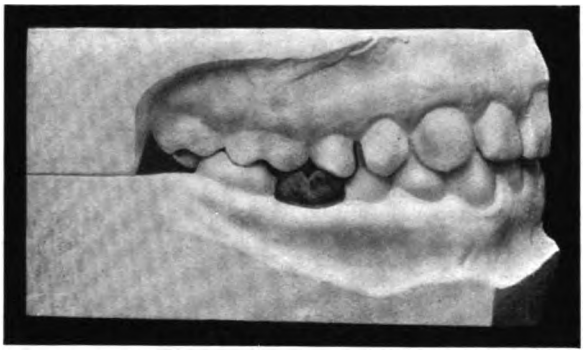


Fig. 7.

Fig. 8 shows upper and lower casts of still another case. In the second molar we see amalgam fillings properly carved, whilst adjacent to them we see flat fillings in the first molars and second bicuspids. A comparison shows at a glance that the teeth filled with properly carved restorations of cusps and sulci are better masticating organs than those with the flat fillings. Indeed, this is so true and of so much importance to the patient that a conscientious operator would be justified in removing the fillings from the first molars and second bicuspids in order to replace them with fillings of proper form.

Fig. 9 shows an example of carving an occlusal filling in a tooth

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having low cusps, and by comparing the filled tooth with its normal neighbor it will be seen that Nature has been fairly well followed.

Figs. 10 and 11 show the occlusal views of a case of bad malocclusion. All of the molars except one were carious, those in the lower jaw being exceptionally bad. On the left side may be seen two large ap-



Fig. 8.



Fig. 9.

proximating fillings, with contact points, approximal dimensions and morsal surfaces restored. On the right side the entire lingual half of the first molar has been built up, while the restoration of the second molar includes the distal buccal quarter of the tooth. These teeth all have extremely long cusps, which will be of great assistance in retention after the malocclusion shall have been corrected; yet note to what extent and with what success these teeth have been restored to normal form and usefulness with amalgam, in spite of the alleged possibility of disturbance during the first twenty-four hours. These cases, I believe, at least, prove the possibility of doing this class of work with amalgam. We must also admit that it is desirable when working with amalgam to work in this manner. Therefore, I say that what is both possible and desirable should be done.

It is said that about seventy-five per cent. of our filling work is done with amalgam. Why, then, devote all our attention to perfecting a technique for the remaining twenty-five per cent? Let us have a definite technique for amalgam work, and let us keep on perfecting this

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until we reach as near a uniform result of excellency as it is possible to attain.

With this idea of evolving a better technique for amalgam work the writer will make some suggestions and give some description of the work

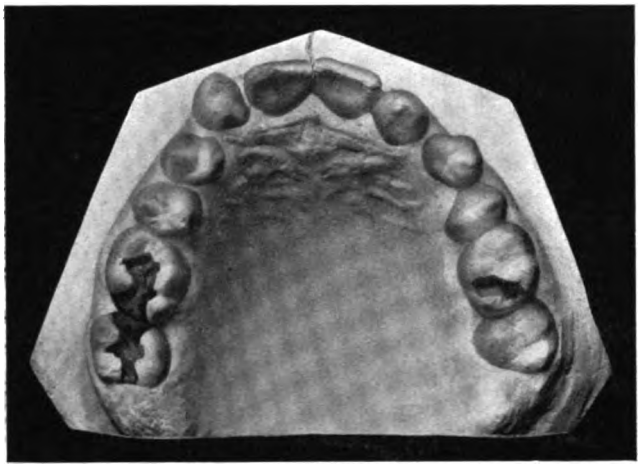


Fig. 10.

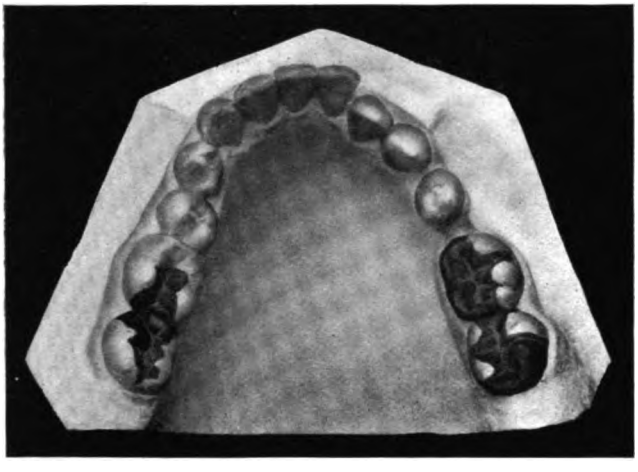


Fig. 11.

as he sees it. It is to be hoped these suggestions may give rise to enough discussion to bring improvement where it is so much needed.

Choice of Alloy for Amalgam Filling.

Regarding the alloy to be used much might be said, but as this subject is being widely discussed and investigated, we shall undoubtedly have more uniform formulas in the near future. Dr. Marcus

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L. Ward, in a recent paper, makes the statement that he is convinced the reputable supply houses are making honest effort to put good alloys on the market. This is certainly a reassuring report from a man of standing. The writer can only say, that having used one alloy for fourteen years, he knows it to be a uniform product, and to his familiarity with the working properties of this alloy he attributes no small share of his success with amalgam as a filling material. This is a so-called quick setting alloy, but is what the manufacturers term "slower setting."

Cavity Preparation for Amalgam.

Cavity preparation for amalgam work should be similar to that for inlays. The margins should be clean cut, polished and well extended, and in their preparation the mounted carborundum stones will be found invaluable. In deep cavities, build up with cement to obtain a typical preparation with flat seat. Little or no undercut is necessary if the first layer of amalgam is cemented in as is the writer's invariable custom. The zinc cements are used, except in a few cases, where the oxy-phosphate of copper seems advisable.

Use of Matrices.

The matrix is always indicated where any contour is to be made. The Ivory matrix holders, with thin steel matrix band, or those cut from celluloid strips are very satisfactory when used in conjunction with wedges placed at the cervix. In extreme restorations, make a soldered matrix of thin orthodontia band material, made either by "pinching" and soldering, as the orthodontist makes a plain band, or cut and soldered from a wire measurement of the tooth. These matrices can be accurately fitted, contoured and wedged, and at the desired time can be quickly split and removed.

Technic for Large Amalgam Restoration.

If a large restoration is to be made, study carefully the occlusion and the movements of the mandible, and if necessary, take a wax or modeling compound "bite" and run plaster casts for study models. A hasty filling of temporary stopping, allowing the patient to close the teeth together while the material is still plastic, will show any abnormal conditions of "bite," which can be allowed for in the amalgam restoration. In amalgam work the rubber dam is seldom indicated, as so many of the fillings extend below the gum. Cotton rolls and the saliva ejector are perfectly adequate except in rare cases.

Dry out the cavity with warm alcohol, and then, mixing a white cement to about the same consistency as for setting inlays (do not use a

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hydraulic cement, as all moisture is excluded), and with a fine instrument line the cavity with the cement. Next apply the matrix, if a compound cavity is to be filled. In difficult cases the matrix should be applied before the cement lining. Now mix the amalgam, everything being in readiness for rapid work, or have the assistant do the mixing while the matrix is being applied. Pack the amalgam, using large pieces and ample pressure, working the first pieces into the cement, covering all surfaces, floor, walls and margins, and wiping away the excess of cement. Then fill slightly to excess, using large pieces and sufficient pressure to produce a homogeneous mass. Contour ample cusps. Except in extreme restorations, where it has been decided to leave a soldered matrix, to be removed at a future sitting, the matrix is immediately removed, being withdrawn from the side, either buccally or lingually, as seems advisable. The margins which were hidden by the matrix are now carefully examined and if any lack of contour shows, a small quantity of filling material may be added. The occlusal surface of the filling is now roughly "troughed out" and wiped over with a pledget of cotton. This gives a frosted surface which will show every contact point when the teeth are brought together. The patient should be told to "close" carefully (and this should be done as soon as possible, and before the filling material has commenced to crystalize), using very little pressure. The occlusal surface is gradually worked down, noting the contact each time of closing. As soon as the teeth can be brought comfortably together, the movements of the mandible are noted and allowed for when necessary.

The filling is now gone over with a large ball burnisher and allowed to set for about ten minutes before further work on it is done. At this time the cervical margins are carefully examined, and as the filling material is now at a more granular stage, any small particles which may have been forced under the gum may be removed with a fine-pointed scaler, and these margins rubbed over carefully with a file (made dull), such as is used in the sets of scaling instruments.

Carving Occlusal Surfaces in Amalgam.

We now turn to the carving of the occlusal surface. The amalgam is now at a stage where it gives a crinkly sound on being burnished, and burnishing gives it a polished surface like nickel. Burnish toward the margins, using a large ball instrument first. Using successively smaller ball burnishers, work out roughly the lines, until with an Ash No. 1 plastic instrument (the fine ball end) the grooves are fairly well outlined. Next reverse the instrument and deepen the lines with the small thin blade. Now with a fine pointed instrument (a pair of very fine-pointed scalers, Grafrath No. 6

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and 7 are about right), the grooves and sulci can be finished as effectively as can be done in a wax pattern for a gold inlay.

Absolutely the last finishing work to be done on the filling is to obtain proper contact points approximately. By this time the amalgam is quite hard and brittle and a fine strip will remove none of the material. Pass a Gordon White separating saw (it will go through a narrower space than even a floss silk) between the fillings, or between filling and tooth, as the case may be, and then with a very thin linen strip with no grit on it, held taut by winding one end around the beaks of pliers and the other held in the hand, polish between the teeth, making a smooth contact point, but removing no filling material. Bring the strip down to the cervical margin, polish beneath the gum, and the filling is done, unless it is desirable to polish some of the margins at a later sitting. This is seldom necessary or desirable, as the finish obtained by burnishing is most attractive. In extreme restorations, where the matrix is left on until another sitting, the later polishing with discs and strips is a necessity. The occlusal carving in these fillings is done as described before.

Technic for Adjacent Approximal Cavities.

Where approximal fillings are inserted, one filling, either mesial or distal, as convenient, must be finished at its approximal contact point (and in this case the wait need not be so long before finishing here) when the matrix is inserted for the remaining filling and this is contoured to meet the contact point planned for the first. Positively two mixes of amalgam should be made and the first filling will be in condition to be carved by the time the second has been inserted. When a number of amalgam fillings are to be made for a patient, practically no time need be lost in waits for carving and finishing as the work may be so arranged that several fillings can be carried on together.

The so-called quick setting alloys take many hours to reach their maximum strength, but two or three hours puts the fillings made with these alloys beyond danger of breakage of cusps or contour, provided proper occlusion has been secured and sufficient allowance made for the movements of the mandible. The greatest danger of breakage is within the first half hour.

Warnings.

A few warnings regarding amalgam work may not be amiss. Do not try to make contours without a matrix and do not try to make too many fillings with one "mix." Do not polish with a disc until several hours after the filling has been inserted, and do not use a cutting strip on the approximal contact points. Do not make the mix so dry that it is crumbly, as it

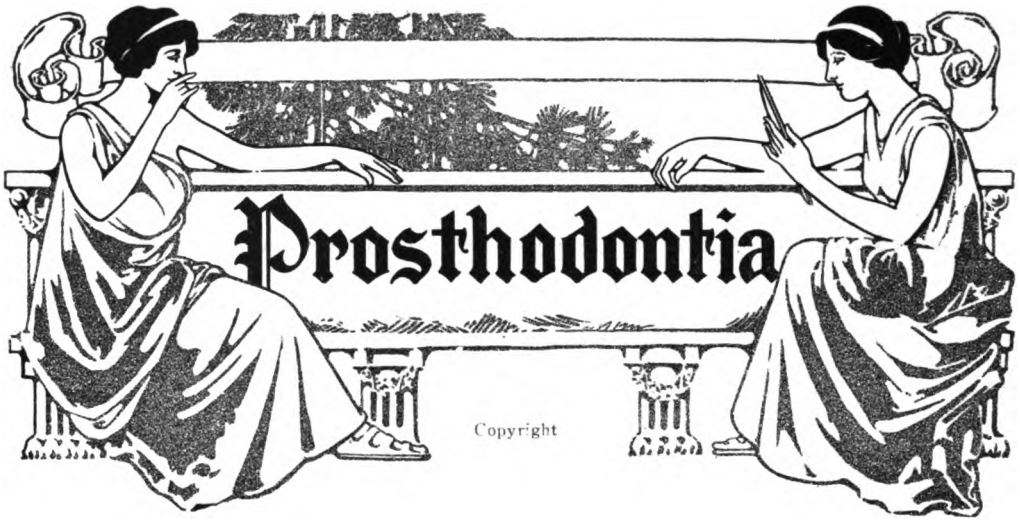
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cannot be contoured, nor made a homogeneous filling under these circumstances. Above all, do not fail to give the same serious attention to detail in amalgam work that you would to a gold inlay, and do not fall short on the foundation work—a proper cavity preparation.

In trying to reproduce natural tooth forms and correct occlusal surfaces, one must know dental anatomy, and have an idea of what constitutes normal occlusion. He must know just where belong the cusps and planes, the grooves and sulci. Surely it is necessary to have an ideal in mind before we try to create mechanically, and I may add, no man of judgment would put fifteen-year-old cusps on a sixty-year-old tooth, nor should he prepare youth for old age by building a flat-worn cusp on the tooth of a child of fifteen.

In closing let me say, that amalgam filling work not only *will* survive, but it *should* survive. It is the "hope" of the fifty million carious teeth in children's mouths to-day, provided we, as dental operators, restore these teeth to the form and efficiency which Nature intended them to have. Are we equal to the task of fifty million gold inlays, and are the children equal to it? I think not. The task looms big enough spelled in amalgam restorations.

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An Incident in Practice.

By Norman S. Essig, D D.S. Philadelphia, Pa.

It happens to most of us some time during the year's work that we are confronted with a case which is in its details markedly different from others of its kind; in other words, one that differs from the majority of the cases that come to us in practice. Restorations by means of plates, crowns and bridges generally bear a strong similarity to each other, and have a marked sameness as far as our methods of procedure are concerned.

The case I am about to describe is in the mouth of a man of about fifty years of age (Fig. 1), whose upper right central incisor had been devitalized for a number of years, during the last ten of which the writer has had an opportunity to watch the case. The first symptom of uneasiness shown by this tooth was a tendency to move forward out of line, but was not accompanied by inflammation or looseness; simply a progressive movement forward. This was stopped by means of a cleet on the lingual surface anchored in the root of the devitilized central, and bearing upon the left central and the right lateral incisor. Some time after this had been done there was a marked elongation, with the result that the tooth became very loose toward the end of the downward movement. It was subsequently found to have no sac at its root, nor any submarginal tartar; the apical foramen had not been sealed and absorption had gone on to a considerable degree. After prolonged treatment it became necessary to extract the tooth, and here it was apparent as the teeth were large and rather bold in type that a tremendous amount of shrinkage

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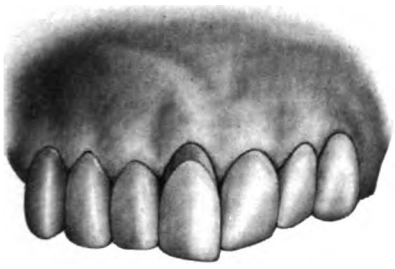


Fig. 1.

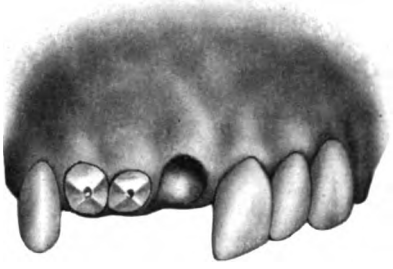


Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.

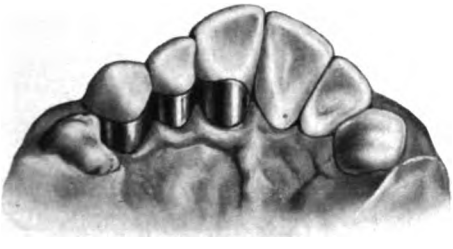


Fig. 8.

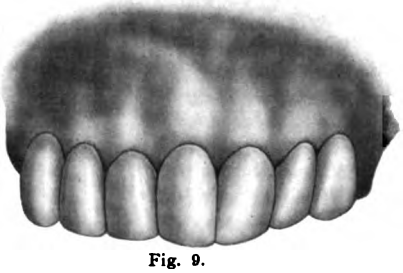


Fig. 9.

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would take place following the extraction of the central incisor. This would necessitate either a porcelain tooth of such length that it would attract attention, or a sectional gum tooth which, in this case, the writer desired to avoid. He, therefore, determined to replace the root of the central with one made of porcelain, and to attach it to the fixture he had in mind.

The lateral adjoining the central described had been devitilized and filled early in life; the right cuspid although filled, was alive and in good condition. It was, therefore, determined to cut off these teeth (Fig. 2) and place upon each root a Goslee crown with cast base. These were attached to each other, and a Goslee central was selected with the longest cervix possible (Fig. 3). To this porcelain was added, forming a root, which would fit into the socket left by the extraction of the central incisor (Fig. 4). This detail was accomplished by cutting the incisor from the plaster model (Fig. 2), and carving it in anticipation of the extraction of the central root, so that when the crowns were put in place, and the porcelain root inserted into the socket carved in the model, the alignment and articulation was gotten without difficulty (Fig. 5). The recess and cavity made in the porcelain tooth to receive the pin was filled with a cast filling engaging the pin (Figs. 6 and 7), so that it could be soldered to the castings of the cuspid and lateral crowns, and embody the interchangeable feature in the central as well as in the case of the other two. When this was completed the central tooth was extracted, and the finished bridge cemented in place (Fig. 8), the porcelain extending up into the freshly made socket, with the result that not only a vast amount of support was given to a bridge of considerable length, but it enabled the operator to maintain the size and appearance, in his reproduction, of the adjoining central (Fig. 9). It has now been over a year since the completion of this operation, and during that time there has been no noticeable shrinkage in the integument above the porcelain root, the soft tissue, having closed tightly around the porcelain, is firm and healthy in appearance.

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Discussion of Dr. Young's Paper.

Dr. F. W. MacDonald, Detroit, Mich.

It is almost absurd for me to discuss a paper of this character since Dr. Young has given us such a detailed description of the fundamentals underlying the technique of the practical use of this new appliance. He has given us the benefit of his practical experience, and I doubt if any of us who has used this appliance can find any weakness or element of error in what he has brought before us this morning. I have always held Dr. Young in great esteem, not only for his mechanical ability, but for his fixity of purpose as well, and I wish to assure you and to assure him that my esteem has been greatly strengthened by reason of the presentation of this splendid paper.

I have looked over the paper carefully and from the standpoint of technique simply, I cannot discover anything that I can take any exception to, or that in the light of my experience I can honestly find fault with. Perhaps this is so because in practice I have followed Dr. Angle and Dr. Young very carefully in the development of their technique.

However, there are a few matters which may be looked upon in the light of theory, which I would call your attention to at his time. One of these relates to the manner in which Dr. Young constructs his bands. I may as well say that I construct my bands exactly as he does, although when I first commenced using this appliance, I did differently. In Dr. Angle's article, published in the *Dental Cosmos,* as you are doubtless aware, we are taught that the bands on the teeth should not be carried beyond the gingivæ, excepting on the approximal surfaces. In other words, the band material should not be cut or festooned to allow

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the lingual and labial portions to be carried over the lingual and labial surfaces of the teeth under the gingivæ.

Theoretically I believe Dr. Angle to be right in his contention. The greatest tensile strength of the band, if it may be so characterized, is derived by having the continuity of the band uninterrupted. But when we come down to practice we have another condition to deal with, which from the prophylactic standpoint must be met. To construct the band without festooning, and then to allow the tube to extend beyond the margin of the band is simply exposing the gingival surface of the enamel of the tooth to a condition that is bound to produce an irreparable damage, especially in view of the fact that with this form of appliance treatment is not as frequent as with the old; so that from a practical standpoint we must necessarily compromise, and sacrifice some of the mechanical strength for the sake of promoting a cleaner and more sanitary condition of the surfaces we should be most careful to protect. To the orthodontist who is careful in the production of tension and who has an intelligent conception of what light tension is, there is no danger of carrying the lip or labio-gingival portion of the band away from that surface of the tooth. However, I can readily understand if a very light tension is not used, that a more dangerous and unsanitary condition might be created.

Another point I would like to call attention to and that is in connection with the soldering of the pins. I have used the pin-holder which has been suggested and I find that there is a great danger, if we are not careful, of overheating the pin. When you have the proper facilities to temper your arch and pins after the work is entirely completed the danger is not so great that it has to be reckoned with.

Aside from these points I cannot see that there is anything that I would care to say in regard to any of the points of technique Dr. Young has brought forward. I wish to say, though, before I sit down, that I consider this appliance the most efficient appliance that it is the privilege of the orthodontist to use. I firmly believe it is the only appliance for a man to use who has great ideals and who wishes to approach these ideals to any extent.

I consider it my good fortune to have entered upon the practice of orthodontia at the beginning of this new era, and my advice, especially to one entering upon the practice of this specialty, is to take the time to master the technique of this new appliance, the fundamentals of which we have had presented to us this morning, for in so doing you will broaden your field to the extent that you will achieve results you could not have attained had you not been proficient in this application.

I wish to thank Dr. Young for presenting this paper at this time.

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I consider it a sister classic to the one he presented to this society in Boston two years ago.

Dr. Martin Dewey, Kansas City, Mo.

It seems that Dr. Young has called attention to some statements which I made yesterday. I was very glad to hear the paper because I have never been in favor of this appliance and am opposed to it now. There is one feature which I have condemned which Dr. Young has eliminated. He has trimmed his bands so that they do not interfere with the approximal contact of the teeth. That is a decided improvement. If you can make the bands narrow enough, so that they do not interfere with the approximal contact of the teeth, you have eliminated one of the objections.

Dr. Young has made the movement of teeth a mechanical proposition. He exercises all force to a limited degree. He says he can measure to a thousandth of an inch and the appliance will move the tooth that much. The sooner we get away from the movement of teeth by figuring or measuring them by the hundredth of an inch, the better our results are going to be.

Dr. Young showed one model where he had the appliance on a deciduous arch. I suppose he put an arch there because there was no space between the deciduous teeth. He had the patient wear the appliance for a number of years and then considered the arch normal. He decided that the appliance developed the arch and that Nature did not. If he had taken the appliance off and had given Nature a chance to develop the arch, the chances are ninety in a hundred that the dental arch would have been normal when it was time for the permanent teeth to erupt.

Because you do not find spaces between the deciduous teeth at six is no proof that they will not be there at six and a half years of age. Individuals develop at different ages. A condition at the age of six may be normal for that individual, and in the next youngster at six and a half a similar condition would be normal for that age. I think we should give Nature a chance to do something in these cases.

In another case he showed models at 14, 16 and 19. If I had to work from 14 up to 19 before getting a result, I would not believe I had a very good appliance. I am convinced from my experiments on lower animals that the development of bone will take place much more rapidly than in five years. It will take place in a few weeks or months, but to get the development of bone, you must have the natural physiologic forces. Therefore, if you use such an appliance as described, you are apt to keep it on too long. You do not give Nature the chance she should have. Dr. Young has been keeping this appliance on a long time

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in certain cases because he was trying to make the movement of teeth and development of bone a mechanical proposition. He called our attention to the fact that in one case the patient was eighteen years of age, where he carried the anterior teeth forward bodily and said he could feel the roots, but no bone had developed between these teeth.

Dr. Young. There was not enough bone.

Dr. Dewey. With the mechanical construction of the "new appliance" you hold the teeth in one position. If you hold the teeth with the new appliance you do so in such a way that Nature cannot do anything for the development. Every time the youngster bites there should be the stress of mastication upon the teeth. There is no development around the teeth because the appliance holds the teeth so firm, that the natural forces do not fall on the structures which support the teeth. Therefore, in regulating teeth, and retaining them, your appliance must be constructed in such a way as to permit the natural forces to have a chance to do something. If you hold the teeth rigid (say five or more years), they are very little firmer than they were at first. You must give Nature a chance to do something while your retaining appliance is on. In every one of the cases there was an excessive overbite of the anterior teeth which would make retention difficult. I believe that in the bodily movement of teeth they are liable to elongate. The overbite depends on the length of the cusps. That is true in man and it is likewise true in lower animals. Take the best normal occlusion you can find and the length of the overbite of the anterior teeth is the same as the length of the cusp of the molars, the premolars and canines. Dr. Young is a fine mechanic. He has made the regulating of these teeth a mechanical proposition. Yet he says he cannot move the lower molar back beyond its normal position. You can move a tooth as far as you want to in any direction if you have the right kind of appliance and understand the principles of force. If you move it in any direction you will get development of bone in response to the regulating appliance if the appliance meets the proper force. In private practice or in clinical practice, if I retain a case more than six months, I retain it too long because the development of bone should take place in that length of time, if all the forces of occlusion are normal, and if everything is normal, there is no object in interfering with it, and there is no reason why you should retain a case more than six months.

Dr. Ottolengui. Does that apply to teeth turned in their sockets?

Dr. Dewey. A rotated tooth is harder to retain because you have to put a band on that tooth, which interferes with the approximal contact and the tooth does not get the

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proper stress. By avoiding the use of rigid retentions many difficulties are overcome and six months is generally long enough for a rotated tooth. This new appliance makes the movement of teeth a mechanical proposition. You can move teeth mechanically, but the trouble comes in retaining them, and when you have to retain from 14 to 19, you are not getting the proper development of bone in between the roots. The spiculæ of bone will not be laid down in the proper positions until you take the appliance off and give the forces of occlusion a chance to act.

The histologic structure of bone and the physiologic construction of it can only be studied through the microscope and with the X-ray in hundreds of cases. If your regulating appliance is made in such a way that it will correspond with the forces of occlusion there will be fewer failures in retention.

Dr. Ottolengui. I wish only to discuss the question of bands. I agree with Dr. MacDonald that in connection with this style of appliance it is advisable to have the bands festooned so that the upper margin of the band metal will pass under the gum tissue an equal distance both buccally and approximally. I think that Dr. MacDonald is also correct in stating that it would be hazardous to have the tube extend beyond the margin of the band if the enamel were left uncovered.

But I have found that this style of band is very difficult to make from a flat piece of band ribbon. I have a pair of contouring pliers designed by Dr. Calvin S. Case for making bands for cuspid teeth, and I have found that by crimping the margin of my band metal at the point where it is to reach the labial margin of the gum, the band metal, if properly festooned may have its free ends drawn between the approximal surfaces, and when pinched on the lingual side, the crimped edge of the band is drawn to very accurate contact with the labial surface.

This method of contouring and adapting a band serves another important purpose. It must be remembered that the force exerted by the pin, through the tube, is first felt by the band itself. If this band is so made that it can be stretched, or drawn away from the surface of the tooth, under the influence of stress, we surely may expect disaster. The crimping of the edge of the band, together with the stiffening of the band by soldering the ends at the lingual side, plus the stiffness received from the presence of the tube on the buccal surface should provide us with an almost rigid atachment to the tooth.

Dr. Carl E. Case, Milwaukee. Until I saw the final models shown by Dr. Young, I was strongly inclined to take the view that this appliance was a very inefficient one and I was fully prepared to say so, but I must acknowl-

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edge, gentlemen, that the results which I have seen were quite a revelation to me, because I did not believe one could accomplish anything of that kind with such an appliance. But even now, in the face of the evidence offered, I cannot recognize its efficiency. In the first place, because of the extreme accuracy required in assembling it; in the second place, because of the skill required to fit it perfectly or accurately to the teeth; and in the third place, because of the extreme difficulty of adjusting or operating it, to say nothing of the skill and care demanded.

From first to last, the apparatus is the most difficult one to manipulate, which I have ever seen. The inclination and paralleling of the pin-tubes on the anterior bands, the similar inclination and paralleling of the pins on the power or spring bow; the insertion of the pins into their respective tubes simultaneously or nearly so; and last, but by no means least, the removal of the bow and its pins from their tubes for readjustment to increase the spring tension and the reinsertion of the bow with its pins into their respective tubes are obstacles sufficient to render the apparatus inefficient, regardless of the results which it may be capable of accomplishing.

Who can estimate the amount of spring force required to move teeth bodily and who can readily control that force? In the instance of causing one or more of the teeth to become intensely sore or lame think of the skill and time required to readjust the apparatus so that the one tooth will be relieved of the pressure without impairing the utility of the appliance.

What would Dr. Young do in such an instance which should be of common occurrence?

One other thing in connection with the working of the apparatus I should like explained; it has seemed to me that the movement of the central incisors must be greater than that of the other teeth on account of the greater length of spring leverage.

Dr. Young. I would like to answer Dr. Case now for fear I might forget what he has said. I spoke of carrying the four incisors forward. By putting a bend in the base wire you would bring the roots of the central incisors forward faster than the laterals. But that is not all I do. In order to bring the lateral roots out as fast as I bring the centrals, I catch the base wire with two pairs of wire-bending pliers and bend the wire, so that I can bring the lateral roots out as fast as the centrals.

I would like as many of you as possible to attend my clinic to-morrow, as that will answer most of the questions better than I can answer them here.

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Dr. Case. Three years ago this apparatus, I believe, was introduced under the title of "Bone Growing," and that was practically the first general recognition of the bodily movement of teeth, although bodily movement of teeth was accomplished successfully with an apparatus in 1892. This was practically twenty-two years ago. I am not going to describe or demonstrate this appliance to you. You may have seen it.

Dr. Young. I have made it.

Dr. Case. In the original models (showing casts) these teeth are seen to be so irregular that all were placed in line before that apparatus was put on. You do the same thing with the spring arch before you put your appliance on?

Dr. Young. I put the appliance on in the beginning of the treatment.

Dr. Case. There are some cases in which we find it necessary to use an aligning appliance where the teeth are decidedly irregular and it is necessary to put them into line.

Dr. Young. I know it.

Dr. Case. This contour apparatus (exhibiting apparatus and casts) is the original one used on this particular case in 1895. It shows how the alveolar ridge has been decreased in size. The accompanying cast shows the position of the teeth when the retainer was originally put on.

I pass that around to show the original contour appliance which was introduced for the bodily movement of the anterior teeth twenty years ago. This one (exhibiting second appliance) is of more recent date. Probably during the last three or four years, the appliance has been perfected. You may say that the appliance is considerably heavier than yours. You may say it would cause considerable inconvenience to a patient, but as a matter of fact it does not. There is no part of this appliance which is rough, and no matter what my patients may think in the beginning, they have told me they suffer very little inconvenience from that appliance after they had it on for a couple of weeks, or not any more inconvenience than would result from any other apparatus. It is also a decided improvement over the original apparatus that was used.

I want to speak of the superiority of this appliance, which is operated by screw force, over Dr. Young's or Dr. Angle's. The fact that you have to depend upon spring force does not permit of the generally recognized required period of rest.

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Dr. Young. What do you mean by that?

Dr. Case. It has been recognized that, as a rule, the apparatus should be tightened once or twice a week, producing just a sufficient amount of force upon the teeth to cause movement and then a prolonged period of rest of three to seven days for the tissues to recuperate. You do not get continuous cell activity all the time. Therefore, you are not as apt to get inflammation of the tissue.

Dr. Ottolengui. That is not a generally recognized fact.

Dr. Case. I believe it is.

Dr. Ottolengui. I do not.

Dr. Case. There is one other thing I want to speak of, and that is the distal and mesial movement of buccal teeth. The distal or mesial movement of buccal teeth can be accomplished just as readily with the proper kind of apparatus as can be the movement of anterior teeth. That was not recognized until a few years ago. Dr. Young has denied the distal movement of molars.

Dr. Young. Under certain conditions. To make myself clear, I am willing to admit that molar teeth may drift forward mesially of their normal position. If they are forward of their normal position, I believe that they can be carried bodily distally. On the other hand, if they are not forward of their normal position in the skull, I do not believe they can be carried bodily distally, but they can always be carried mesially.

Dr. Case. One other point, and that is in regard to the working retainer. That working retainer was used for the purpose of holding the roots of the teeth bodily forward by the exertion of spring force. It later was given greater scope and moved the teeth bodily. The appliance was originated for the same purpose that my retaining apparatus was originated, *i. e.*, for the purpose of retaining the teeth bodily. But yours operates by exerting force, while mine operates by resisting the reactive forces. When it has a solid grasp on the tooth it is held firm. The relation of one tooth to another in a firm position cannot be changed and the bodily movement is maintained. There is no force at all being applied to the teeth except that which is intended to hold the teeth in position, which it does.

Dr. C. A. Bawley, Washington, D. C. I want to call attention to the great accuracy which Dr. Young has developed in constructing these new appliances and as I listened to his paper, I wondered at the accuracy of his technic. Usually, it is

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the tendency of the human mind to depart from the strict teaching received and attempt to find something better, something original, but I would advise in commencing the use of this appliance, to adhere closely to the technic given.

In regard to the question of incisal bands; while there is a difference of opinion as to whether it should reach the gingival line in the incisal region or whether it should be pinched from the under side and not reach it, in either case these teeth are kept immeasurably cleaner than they are under the ordinary arch. In some cases where there are deep festoons and the bands do not reach the gingival line, after this appliance is adjusted, they are so firm and there is so little danger of loosening that the patient will keep them clean and there is less danger of injury to the soft tissue than with the ordinary expansion arch.

I have adjusted a large number of these appliances in the last four or five months. Some of these cases, eight or ten of them, were cases of young children for whom I am beginning treatment. As an instance of their advantage, I might mention a little boy nine years of age. He is typical of a class that many of us have. A perfectly healthy boy, and one that has been raised with the idea that almost anything that is done to him that makes him uncomfortable, is fundamentally wrong. If you scold him very much you are apt to have trouble. I had my assistant stand by the chair, ready to check every movement, in order to keep the boy in it. He was a good-natured boy. After tormenting me to death so that I came near throwing him out of the window, he would get up from the chair, make the politest bow and say, "Good-bye, Doctor." (Laughter.) But after I got this appliance on, I never had any more satisfaction in my life than to see him come back once every two or three weeks with everything in position. If I had used ligatures in his case, he doubtless would have returned each time with most of them untied and if he could possibly have worked the appliance loose, he would have done that. I began to make a certain movement by a bend in the arch and when the boy would come back at the end of the time specified, I would get that movement accurately. My success in such cases from the use of this appliance has been very gratifying.

There is a point that Dr. Young mentioned that I would like to emphasize. You can move teeth just as fast or faster than with ligatures and the ordinary expansion arch, but that is not the point. You can move them as fast as you want to and do not need go any faster. You do not need to go faster than you ought to go. It is under absolute control.

I would also emphasize the point and impress upon you the importance of what the author of this paper has said with regard to paying

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attention to details. The work he has described is very fine work indeed. I do not think we have ever adjusted an appliance that required as delicate work as this does.

In regard to some of the points referred to by Dr. Dewey, I cannot resist the temptation of discussing them briefly. He speaks of the normal development of a child's denture, and tells us that we interfere too much, and that if we leave it alone we will have normal development. Gentlemen, I have watched cases for a good many years and I have models of children's mouths that have come back to me at two, three and four year intervals. I have watched carefully for Nature to do something, without interference and I must say that I am discouraged. I do not see how we are going to get movement of teeth unless we get it mechanically, and the more accurate that mechanical work is, the better.

I would not want to take Dr. Dewey's statement in regard to this matter unless he has models of children's mouths to show me that they have moved in the normal way after intervals of three or four years. I have not seen such models.

I have not seen a normal development of a child's denture under the present conditions of living. I have seen a good many that have no such development and I do not want to accept a mere statement that there is such development, until I see the models.

Dr. Ottolengui. You mean to say that there is no such normal development?

Dr. Hawley. Not by any means, but in the ordinary child we do not see it. There may be some such children, but I have not observed them in my practice. If there is an appliance by which Dr. Dewey can treat teeth, retain them for six months and then take off the appliance and have the teeth stay in position, it is something he has kept quiet and has not said anything to us about, because our experience is that once treated, the teeth will not stay in place without longer retention. There is not the rigidity about this new appliance that Dr. Dewey seems to think there is. The bands are not in rigid connection. The teeth are held with a tube and pin and some movement of the teeth is permitted. There is some natural movement that will prevent the bands from becoming loose. They are not so apt to become uncemented as you think because they are not collectively rigidly held.

Dr. Young has stated the difficulties of the appliance better than I can and more accurately. The main thing that I wish to speak of is the matter of experience with this appliance in my hands. I have obtained very gratifying results with it and can see a promise of great relief from many of the anxieties of my former work.

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Dr. B. E. Lischer, St. Louis. While Dr. Young was reading his paper I interrupted him by asking the question: How would you treat a tooth that has only partially erupted? and he replied he would leave it alone until it was long enough. Now, I wish here to recall the distinction Körbitz, of Berlin. makes when he says that a tooth may be absolutely too short, or, relatively too short. In other words, a tooth that has only partially erupted is absolutely too short; a tooth that has fully erupted and is still too short because it fails to come into occlusion is said to be relatively too short. I think it a fine distinction and I would now like to ask Dr. Young how one can elongate upper lateral incisors that are relatively too short, with this new appliance.

Dr. Martin Dewey. I want to make an explanation as there was some misinterpretation of what I previously said. I said it is never necessary to retain a case more than six months, if you have the normal forces of occlusion operating. But if you do not have the forces of occlusion operating you might have to retain the teeth for a lifetime. That is my proposition.

Dr. Federspiel. It is a question of whether deformity is secondary or primary, and if you remove the primary cause early enough, the secondary condition is not fixed, and I am satisfied the child will go on developing normally. If the secondary condition becomes fixed and the primary cause is not removed, that is another question.

Dr. Hawley. I would like to ask Dr. Dewey what he means by the forces of normal occlusion. Does he mean that in case you see a perfectly corrected malocclusion, the teeth must be in absolutely correct occlusion, with the buccal cusps in absolute contact. Ideally we may correct a case with that condition in view, but practically there have been very few cases shown where we have absolutely ideal occlusion.

Dr. Ottolengui. I would like to ask Dr. Dewey a question. I am very much in accord with his views. but it is not clear to me what he just said. If you fail to obtain the normal force of occlusion, you have to retain the teeth a lifetime. Did he not mean until we do get the normal forces of occlusion?

Dr. Dewey. If the normal forces of occlusion are not established we must retain the teeth a lifetime or until they are established.

Dr. Ottolengui. That applies to almost any case. I have been getting satisfactory results in the last two or three years by removing my retention from one jaw first,

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allowing that to be unrestrained, while the other was retained, and then after the bone growth and gradual fixation of the teeth of that particular jaw, it will be safer to remove the retention from the other.

Dr. Fischer. Regarding the point relative to the length of time required to secure permanent maintenance of the newly established relations, Körbitz recommends removal of the post-treatment appliances in parts, and that the lower incisors and cuspids be held longer than other parts of either arch. He maintains that they are a powerful factor in shaping the form of the entire denture and I quite agree with him.

Dr. Young. I am very much pleased with the discussion on my paper. I said in the beginning, I believe in short papers, because in that way one is more likely to get his paper discussed, and I dislike to read a paper and not have it discussed. In this instance I have written a long paper and there has been a splendid discussion of it.

I am going to try to answer each man in the order in which he discussed the paper. The first one is Dr. MacDonald. Just a word on that little pin-holder and the fault he finds with it. These pin-holders are so made that the pin will go in too far. If you will pinch the two sides together so that when you force the head of the pin in that it is held firm, you then have 15/100 of an inch of that delicate 22/1000 wire between the end of the pin-holder and the point where you are to solder. This prevents the pin-holder from getting hot.

I believe that we should strive to construct appliances so as to exert a constant delicate force, not an intermittent force. And just in proportion as we are able to do this will we be able to move teeth in the most physiological manner. That is why I have advocated to Dr. Angle that a loop should be bent on each side of the middle section of the arch just in front of the square portion that telescopes into the screw section. I do not claim that by means of these loops I get a constant, uniform pressure for a long period, but I do believe that the pressure continues over a much longer period than where the middle section of the arch is left without loops. If we can construct an appliance so that the pressure exerted on all bands attached to the teeth will be constant and uniform for the entire period of active treatment, then I would say it was ideal. We have not such an appliance, nor do I think it possible to construct one.

Dr. Case. I would like to ask what you would do in a case in which you are causing inflammation or soreness of any of the incisor teeth you are moving with that spring force?

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Dr. Young. If you have inflammation or soreness it is because you have used too much force.

Dr. Case. How do you know what force you are exerting?

Dr. Young. My judgment would tell me. I am not advocating the elimination of screw force. I do not believe we will ever eliminate screw force in the movement of teeth; but I say, if we could eliminate it we would be better off.

Dr. Lischer spoke of the elongation of teeth. With this appliance it is the most simple thing to elongate individual teeth. For example, where the laterals are in infra-occlusion as we frequently see them in the upper arch. The middle section of the arch should be so bent that when the pins are soldered to it and the appliance placed in the mouth the pins that enter the tubes on the central incisors and cuspids will pass through so that they lock and those entering the lateral tubes fail to lock. With a suitable instrument the arch wire is sprung upward so that the lateral pins lock one at a time and as there is no slipping the laterals must elongate, owing to the constant pressure exerted.

If you recall, at the meeting in Washington, Dr. Watson gave us a paper in which he spoke of a cuspid to cuspid retainer and leaving it on the last thing.

I have been using these cuspid to cuspid retainers on the lower teeth ever since Watson gave that paper and it is usually the last part of the retaining device to be removed. The objection to this form of retainer is that two teeth are firmly bound together. If we could get some way of retaining this part of the lower dental arch, the normal width without interfering with the normal mobility of the cuspids, we would get a more physiological development of bone in this region.

Dr. Ottolengui spoke of contouring pliers for forming bands. I have used these pliers. You can use them on band material for making bands for the cuspids, laterals, centrals, or lower incisors. I use them all the time. I am glad he brought up this point because by pinching the band material with these pliers you have crimped the edge a little bit and put the metal in shape so that the band is very much more rigid when made than if you pinched the band with the metal flat.

Dr. Case has devised some ingenious pliers. I have a full set of them.

Dr. Hawley spoke about pinching bands on the lingual side leaving the impression that if the bands were pinched on the lingual side they could not reach the gingival line on the labial side. That is not so.

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Dr. Rawley. Generally you do. They can be so left, and Dr. Angle's instruction was to do that; to pinch them on the lingual side and leave them free from the gingival border of the labial side.

Dr. Young. There are some cases where it is not necessary to put them up to the gingival line. The farther we get away from the gingival border of the gum with our appliances the better off we are. That is why I think so much of this appliance. We have no ligatures to cause irritation of the gum tissues.

In regard to the remarks of Dr. Dewey about the mechanical movement of teeth, all orthodontic appliances we use are mechanical movers of teeth. I believe that no man has ever lived who can put an appliance in the human mouth and move teeth exactly as Nature will move them. We must do the best we can with our present knowledge. We may know more about it later on, but we must move teeth mechanically if we move them at all.

In regard to the lack of spaces between the deciduous teeth, Dr. Dewey said that ninety per cent. of these deciduous dental arches would develop normally without mechanical stimulation. In answer to this statement I wish to ask one question and let him and every man answer for himself. If in ninety per cent. of these deciduous cases, this normal development takes place, why is it that ninety per cent. of the people in this room have a crowded condition of their lower incisors?

It does not happen in ninety per cent. of all deciduous cases and I doubt if it takes place in two per cent. of the cases of children that live in a civilized way.

The case that was treated from 14 to 19 was first treated by means of the expansion arch and ligatures and the crowns of the teeth put in proper position and then retained with the hope that Nature and the forces of occlusion would stimulate bone development, but instead of this happening the teeth settled back. It was subsequently treated by means of the appliance we have under discussion to-day with the result shown, and I am not ashamed that I took so long with the case. I find that bone develops much more slowly in some cases than in others and I always try to gauge the tooth movement by the way the surrounding tissues develop.

Dr. Dewey thinks that with this form of appliance the teeth are held in a fixed position. That is not so. The teeth are free. I told you in my paper that in carrying the teeth forward, they would go on and rotate beyond the normal if you did not make some provision to prevent it. There is not a fixed thing in the whole appliance. Every tooth has

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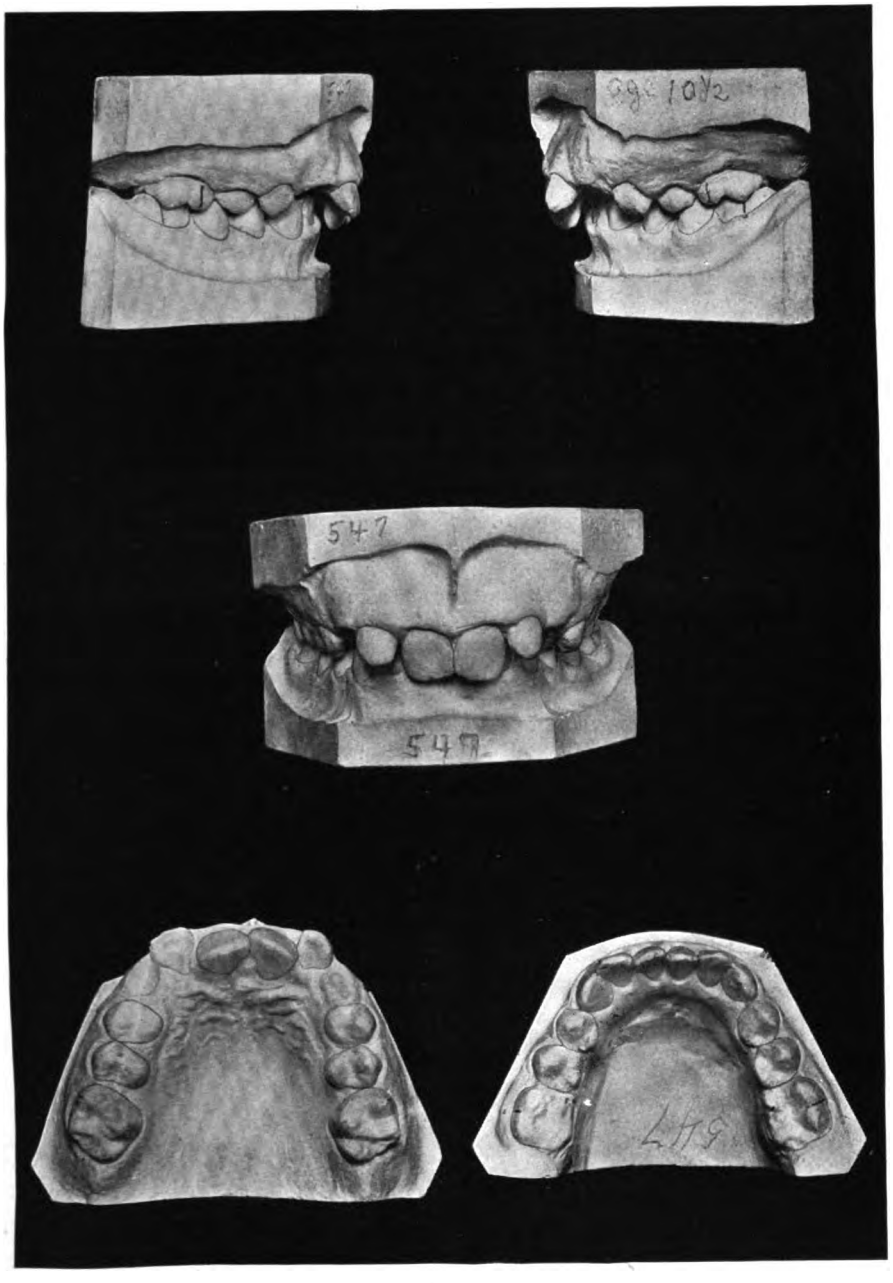


Fig. 24.

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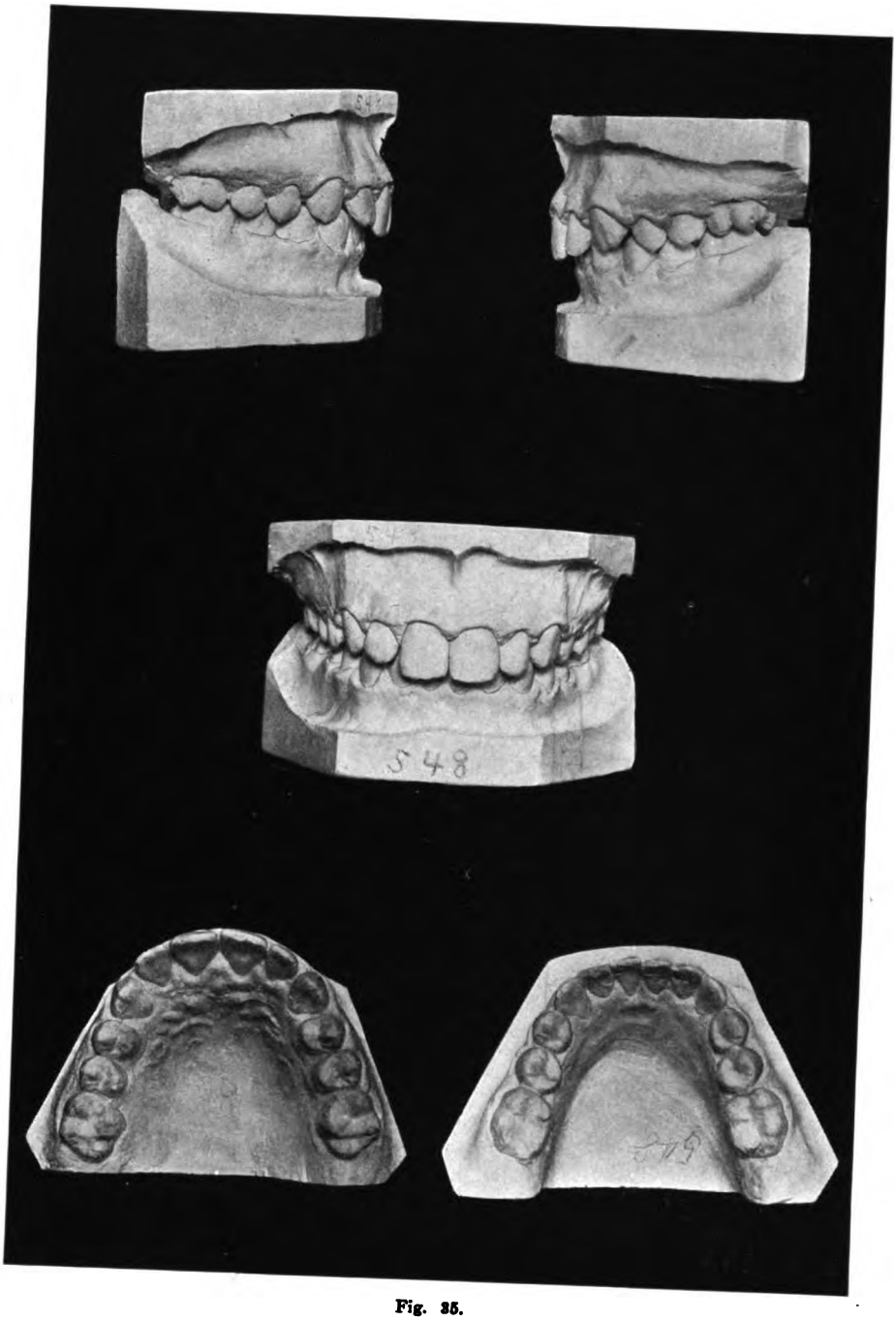


Fig. 35.

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some movement. On the other hand, I will admit they have not the same latitude of movement and chance for normal bone development as if there was no appliance on them.

As to the matter of holding the teeth too long. In the case of the



Fig. 36.



Fig. 37.

boy whom I treated two years (Figs. 26 and 27 of my paper), I was much dissatisfied with the bands on his upper teeth. He was going away for the summer, and I took everything off of his upper teeth. I did it with the distinct understanding that I might in the autumn reapply this appliance. I did not take the appliance off the lower. If Nature takes care of these upper teeth I will be much pleased. These teeth have relapsed some.

I do not think it is possible with any mechanical appliance to put

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every tooth where it ought to be. Nature has the final say, no matter how accurately we work.

Dr. Dewey makes the statement that it is never necessary to retain a case more than six months if the normal forces of occlusion are operating, but he fails to tell us how to cause this result to be obtained.

In this connection I wish to show some slides of a case that seems

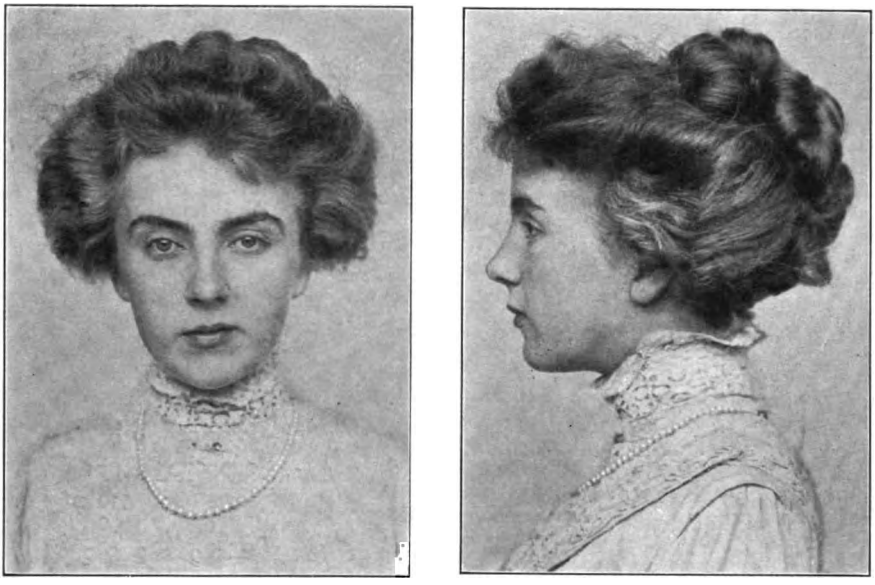


Fig. 38.

to prove to me, at least, that there is a pernicious tendency for certain teeth to relapse to their former position.

Fig. 34 shows models of the teeth of a child ten and a half years old before any treatment was begun.

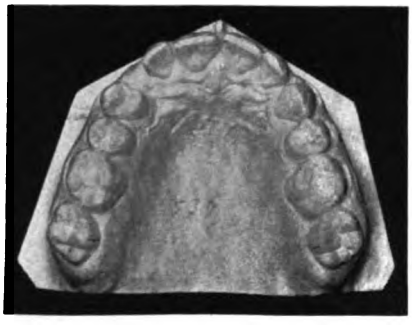
Fig. 35 is like view one year later when retention was applied. The upper retainer consisted of a bite plane attached to bands on the upper central incisors with a wire extending back from it into tubes on the lingual surface of the upper molar bands. This retainer was worn for two years. The lower was retained with the lingual arch running from molar to molar in addition to a wire fastened to bands on the lower cuspids. This lower retainer was worn for two and a half years, and during this six months that the upper retainer was removed previous to the removal of the lower, there was no tendency of the upper

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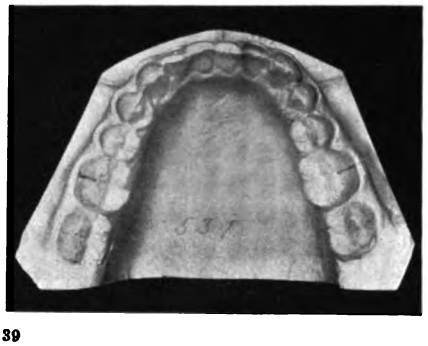


Fig. 39

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central incisors to relapse. It was then considered safe to remove the lower retainer and three months later models were made and the result is shown in Figs. 36 and 37. In these, you will observe, that the right upper central has moved lingually sufficient to carry the right lower central and lateral lingually and thus force these teeth more out of alignment than they were originally, as shown in Fig. 34. Now, will Dr. Dewey tell us what we must do to overcome such tooth movement as I have shown in this case? I presume, of course, he will say that the

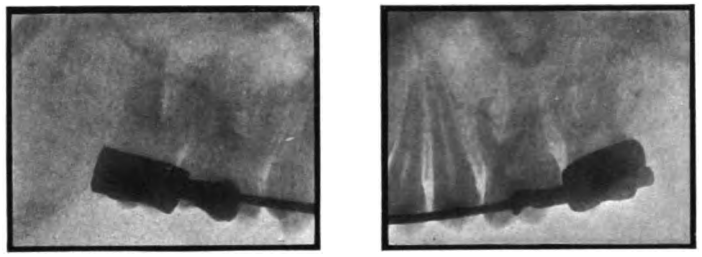


Fig. 40.

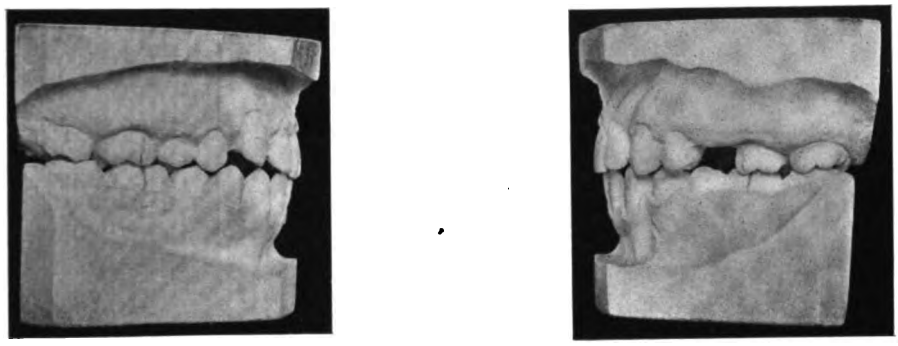
bite plane fastened to bands on the upper centrals held these teeth so rigidly that bone development was impossible. I have another case similar to this as far as the position of the upper centrals is concerned, but which was Class I and was retained without any atachment whatever to the upper centrals, and after two years, the upper retainer was removed and the right central has drifted lingually sufficient to cause soreness of the lower incisors. These lower teeth, however, cannot drift lingually, owing to the retaining device still being in place.

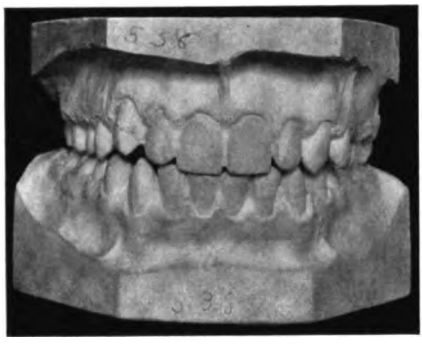
Dr. Dewey further states that teeth can be moved in any direction and new bone will form around them if proper force is applied. In reference to this I wish to show a number of slides of a case in which I absolutely failed to move teeth as I wished to do.

Fig. 38 shows profile and front view of the face of a young woman eighteen years of age.

Fig. 39 shows profile, front and occlusal views of models of this case at the beginning of treatment. My diagnosis of this case was that the molars and bicuspids on the right side had drifted forward and that the molars on the left side had also drifted forward and I decided to move these teeth back and thus prove that Dr. Angle was wrong when he contended that the first permanent molars never drifted too far forward. I, therefore, started in by applying force to the upper second molars using the entire lower dental arch as anchorage to force these two teeth back with intermaxillary rubbers. After several months' treatment of this kind

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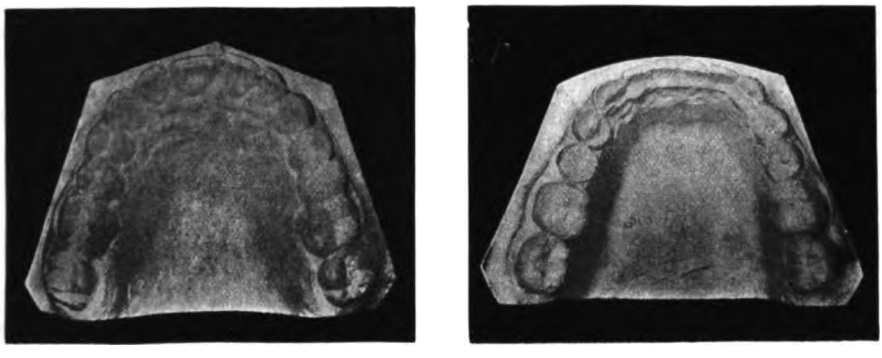


Fig. 41.

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in which the second molars were tipped distally, the appliance was changed so as to apply the force on the first permanent molars and the treatment continued as before. These teeth, however, owing to their better occlusion were found to tip much less than did the second molars, but they would not move distally. The occipital anchorage was then resorted to with the hope of moving these molars as desired, but even



Fig. 42.

with this application of force at night with the intermaxillary rubbers in the daytime, it was found impossible to move the molars bodily back. I then concluded that the unerupted upper third molars were responsible for my failure to move these teeth distally so had X-ray pictures taken as shown in Fig. 40; in these you will observe that there are no third molars present.

About this time Dr. Angle came to my office and I showed him the photographs and models of the case, and his diagnosis was that the upper front teeth should be carried forward so as to make room for the unerupted cuspid on the right side and to provide a space for a second bicuspid on the left side, where the X-ray shows the tooth congenitally absent and then treat as a Class II case. This I proceeded to do, dispensing with the occipital anchorage and intermaxillary rubbers and after three months' treatment the case presented as shown in Fig. 41.

Fig. 42 shows profile and front view of the face at this time and

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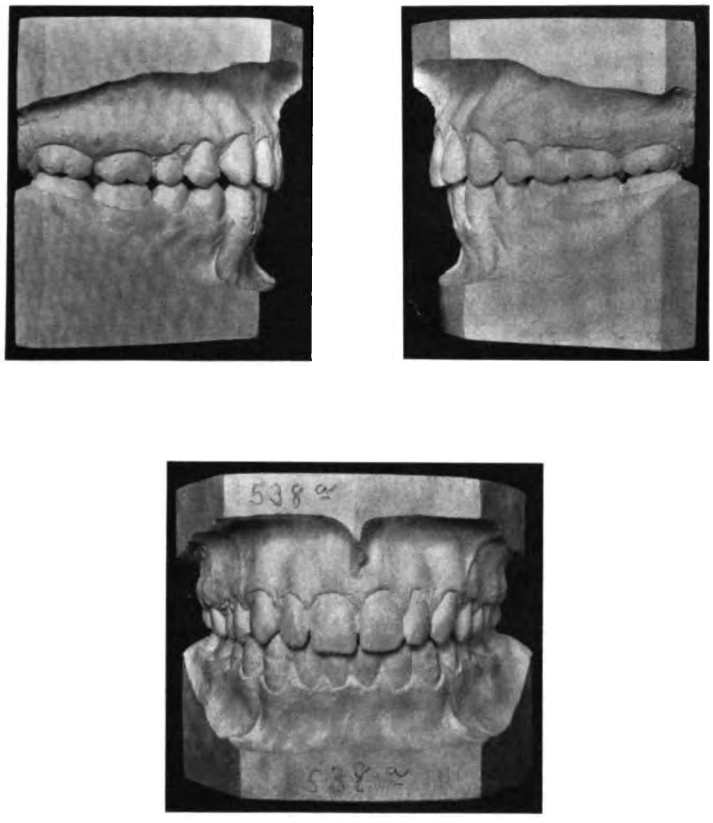


Fig. 48.

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Fig. 43 shows the occlusion of the teeth a year and a half after Fig. 41 was made, and Fig. 44 the profile and front view of the face. The mandible moved forward of itself when the upper arch was enlarged sufficiently to accommodate the lower one so that the molar teeth could

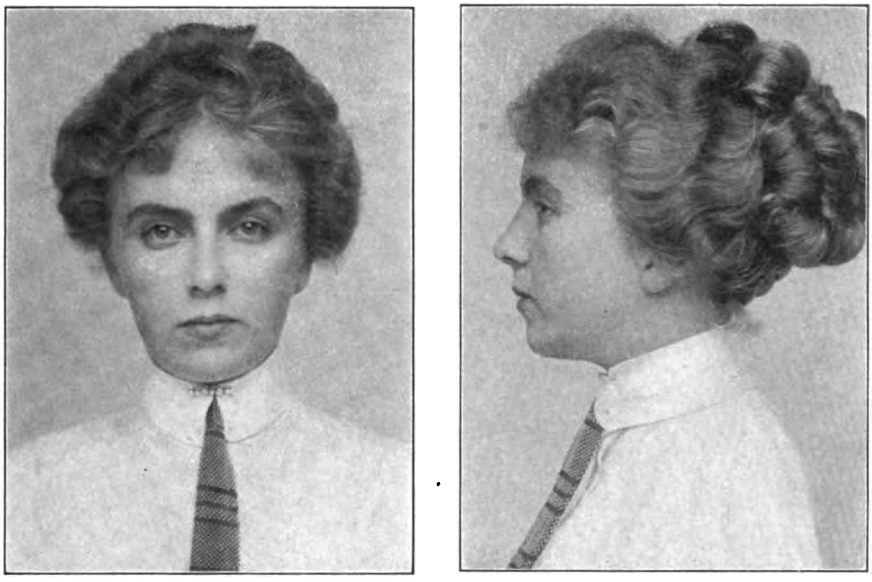


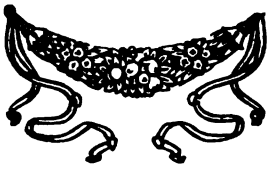
Fig. 44.

occlude normally and the lower teeth were never retained in this mesial position.

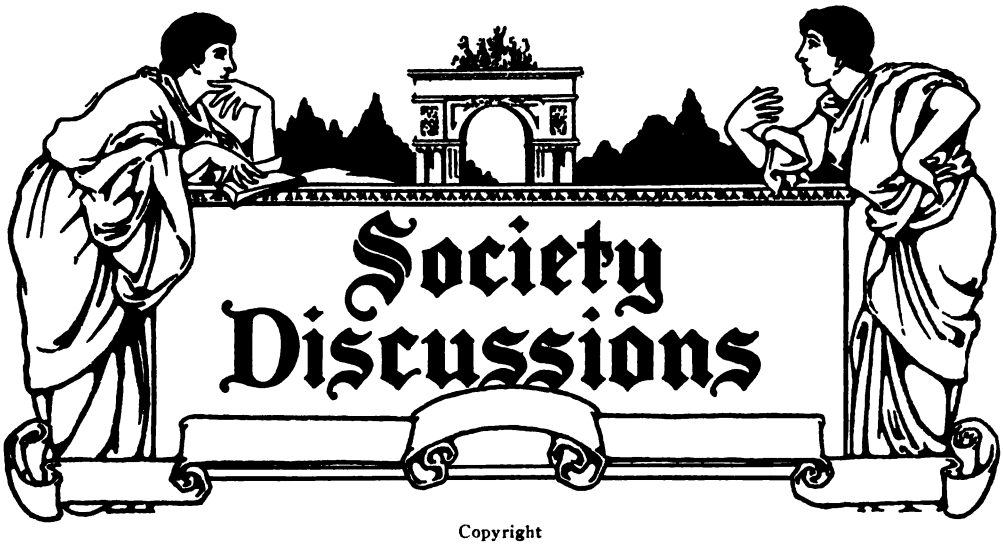
Now, I do not claim that it is never possible to move molar teeth distally, but I am of the opinion that if these teeth are in their normal position that the best we can do is to tip them and not move them bodily distally. I am convinced that where the buccal teeth have drifted mesially that it is quite easy to move them bodily distally as shown in Figs. 28 and 29 of my paper. You will observe, if you study these pictures that the lower molars were distal to normal in relation to the upper ones, or, to be more correct, we should say that the upper molars were mesial to normal in relation to the lower ones in this case. These molars were moved distally without any application of intermaxillary force, and as Dr. Grunberg has shown by means of the symmetroskop, that the majority

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of our subdivision cases in Class II and Class III are really cases in which the buccal teeth on one side have drifted forward, and careful examination of the models of a number of treated cases shows that these teeth have moved distally without any effort being made to cause this distal movement.



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Second District Dental Society.

November Meeting.

A regular meeting of the Second District Dental Society, of the State of New York, was held at the Kings County Medical Library Building, 1313 Bedford Avenue, Brooklyn, N. Y., on Monday evening, November 10, 1913.

The paper of the evening was read by Dr. R. Ottolengui, and was entitled: "Some Suggestions for the Improvement of the Dental Law of New York and other States."*

President Lewis. The members of the Legislative Committee were asked to discuss this paper. Dr. Cooke, of Syracuse, and Dr. Burkhart, of Batavia, are unable to be here. Dr. William Carr, chairman of the Law Committee of our State Society, will open the discussion.

Discussion of Dr. Ottolengui's Paper.

Dr. Wm. Carr, New York. In Dr. Ottolengui's paper the purposes of dental legislation are just reversed. The only ground upon which courts have sustained such legislation is that it is a protection to the public health. Therefore certain educational qualifications are required as a condition of license;

*This paper was published in the December issue.

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unlicensed practice is made a misdemeanor and provision is made for revoking licenses for unprofessional conduct and gross incompetency.

Post-Graduate Instruction.

Apparently Dr. Ottolengui favors a statute prohibiting any person, even a licenciate, from giving post-graduate instruction unless licensed as a teacher. It is certainly desirable that incompetent men should not undertake to teach what they do not know. But it would seem impracticable and undesirable to forbid one having special knowledge to impart it. The dental law and the education law both forbid the use of the name "college" by persons unauthorized to use it, or the conferment of degrees or licenses except as provided by law. To go further and forbid any instruction to be given except under legislative restrictions is at first blush undesirable, and is at least a matter for careful consideration. The courts have allowed persons shown to be learned in special departments of medical science to testify as experts, although not physicians. Pasteur, the great French pathologist, has been said not to be licensed as a medical practitioner, and therefore not legally entitled to make his own inoculations. I do not vouch for the accuracy of this statement, but it illustrates the point. Every paper read in a dental society purports, at least to be post-graduate instruction. Every such society is, in its scientific aspect, a "study class." It may be that persons undertaking as a matter of business to give post-graduate instruction systematically, continuously and for hire, should be required to give proof of qualification; but it is certainly undesirable to multiply unnecessarily laws in restraint of personal liberty when it is found so difficult to enforce those that we have.

Boards of Examiners.

The purpose of creating boards of dental examiners was primarily and chiefly to do away with the "diploma standard" of license, and that result has been measurably achieved. A purchased diploma is no longer a license to practice, since the holder of the best diploma must pass State examinations.

The proposal to have examiners themselves examined suggests the doubt that the Roman satirist (Juvenal) expressed in his famous question—"Who will watch the sentinels?" and also the practical question, "Who will examine the examiners?" As to the supervision of the medical and dental professions, and the inspection of colleges, are not all these powers now lodged with the Board of Regents and Examiners?

Appointment of Examiners.

The objection to appointment of examiners from without the societies has been that presumably all competent and licensed and ethical dentists are, or should be, members of the societies.

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There is no reason why the State should not pay the examiners as well as the clerical force of the Regents, except that to do so will swell the annual expenditures, already excessive, with no assurance that the paid board will do better work than those who serve out of public spirit, and a reasonable assurance that salaried places would be political patronage. It is a question, too, whether men withdrawn from the active practice of their profession are as qualified to examine students as those who are daily confronting the clinical problems that arise. A man may have his brain stored with the knowledge and the theories of books, and yet be hopelessly incompetent as a practitioner or an examiner of practitioners. And in a permanent salaried position, in its nature clerical, he is less apt to keep abreast of the times.

Control of Dental Mechanics.

It is not a fact that the present law permits mechanical men to practice, in the sense of doing work in the oral cavity. Whenever such work has been proved to have been done by an unlicensed man, he has been convicted.

The evil referred to would not be remedied, probably it would rather be increased, by calling laboratory men "mechanical assistants," requiring them to register, and expecting their employers to keep track of them. Do the licensed men now keep track of the unlicensed? Do they furnish evidence of their violations of law? In truth, do not many of them permit unlicensed men to work in their offices? Will they be any more likely to report offenses when the laboratory man is given a legal status or a title that he does not have now, whereby the difficulty of prosecuting him will be increased? As to the employer being made responsible for his mechanical assistant, he is now responsible in a civil action for damages sustained by his bad work, and responsible criminally if he aids or abets him in violating the law, provided it can be proved that in practicing he acted in the course of his employment by the principal. To compel mechanical men to register, would render it possible to prosecute them for doing mechanical work without license; but it would not probably deter them from doing operative work any more than the present law.

There is a wide and obvious difference between the pharmacist's apprentice and the mechanical dentist. The former, for the most part, is a clerk in the shop, under the principal's eye, etc. (differences will suggest themselves).

I do not pretend to pass upon the question of the interlacing of operative and mechanical work; but to define the boundaries by statute would be, I think, like defining "fraud," which the courts have never

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attempted to do, because to define it is to make a definition of what fraud may be safely committed.

The New York courts having failed to make a working definition of medical practice, announced recently that they would not try to make a hard and fast rule. Still, a definition of dentistry was attempted in the bill proposed last session, which was defeated by the very persons Dr. Ottolengui has in mind: the men with "parlors"; the men who employ mechanics to operate; the men and women who succeed to the business of deceased persons. On the other hand, the bill met no cordial aid from many who professed to desire its remedies. I never saw anything so foolish as the claim that recognition of a dental nurse could not be put into the statute because there is no such person. You can put anything into a statute that you can get through the legislature; with the result that some of the statutes are of a nature to make the angels weep tears of blood.

Illegal Practitioners.

If it be true that New York has more illegal practitioners than are to be found in all the States combined—an extravagant statement that can be substantiated only by statistics, it must be because of the peculiar conditions existing here. Out of the 90,000,000 or more of population, New York has about 10,000,000. No other State has a congested population such as exists on the East Side of New York City, made up of foreigners who immigrate here to sit down in the first port of entry, bringing their own customs and habits and quite out of touch with the spirit of our laws and legal administration. Coming from localities where the barber or blacksmith is often the dentist, they adhere to old habits. The "confiding and deluded" citizens humbugged—if they are humbugged—by these dental practitioners, refuse to report them or testify against them; and when compelled to come to court by subpœna, often testify falsely in behalf of the accused; perjure themselves out of sympathy or less worthy motives. If every practitioner would then report all men practicing illegally, with a statement of his grounds, in fact, for believing that the accused was practicing, then a long step would be taken toward weeding out illegal men.

But experience does not show that this will be done. As it is now, reports of illegal practitioners are rarely made, and when made, they are generally anonymous; if not, they are animated by strong personal motives that prejudice magistrates, and very rarely is the person making the report able or willing to give the name of a single person upon whom the accused has practiced; or give any competent evidence to support his suspicions.

It is true we cannot convict a man of practicing dentistry unless it

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can be proved in court that he has practiced. Fortunately, it was enough to satisfy the court if we proved one act of practice and surrounding circumstances. Lately, a Brooklyn dentist, for his own personal reasons, retained a lawyer to prosecute a man, with the result of obtaining a ruling in the Appellate Division that practice consists of a series of acts and cannot be established by proof of one act. It would seem very easy to prove the sale of whiskey, but the courts require that the article sold be proved to have been whiskey. It is to be hoped that the courts will continue to protect personal liberty by requiring that a man shall not be convicted of crime until the crime is proved.

Dental Inspectors.

As to having inspectors go about into all the offices and make their interrogations, that experiment was tried lately by a man who had to be quickly discharged on account of his hectoring performances. Such inspection would be resented, probably, as much by the reader of this paper as by anyone present, and probably by all present.

Moreover, the often puzzling questions of identity and false personation would still remain. The law now requires every practitioner to post his name conspicuously, yet it is very difficult to discover at times who is the man whose name is posted, and whether an unlicensed man is not masquerading under the posted name.

Definition of Dentistry.

It has been already noted that the courts have abandoned the attempt to make a hard and fast definition of "medical practice"; for the same reason it is hard to make one of dental practice.

The suggestion of signs is met by the present statute making it a misdemeanor for an unlicensed man to *hold himself out* as a practitioner. And he does not do so by sign, save in rare instances when ignorant of the law.

The attempt to control by statute the use of signs was made, as already said, and failed at the last legislature, the bill being lost through the use of money.

Dr. Ottolengui insists that a statute can be drawn so that evidence could be obtained without the use of "spies"—what else would his "inspectors" be? "That which we call a rose by any name would smell as sweet."

There seems to be an assumption that attorneys employed by the society should personally procure evidence. That is revolting. The other assumption, that detectives employed by a State Board would be less apt to "graft" than those of the society, is gratuitous and not supported by facts.

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The prevention of cruelty to children, of cruelty to animals, of vice, etc., is entrusted to societies called "auxiliary governmental agencies," of which the State Dental Society is one.

The prosecuting officers to-day are the District Attorneys, who generally accept the aid of the society's counsel. The suppositions that paid inspectors would not be grafters is not confirmed by experience, any more than experience confirms the theory that other salaried employees of the State will not be grafters.

Now, can any man advance such a theory with the object lesson before him of the Governor of the State impeached for grafting and found guilty as charged by the unanimous vote of the Court of Appeals, and yet be re-elected to office? How can anyone, in view of the late mayoralty campaign, believe that any man who is in an official position can escape the charge of grafting by those who promptly accept every evil rumor as a fact, and believe every man to have his price?

Revocation of License.

The man who served his profession by writing the definition of unprofessional conduct into the Michigan law, did no more than incorporate into the statute a definition given by the courts in various States without any statutory definition.

One would suppose that Michigan was under a perfect law and free from medical or dental quacks. Let him visit Mount Clemens. At those springs, the rubbers are no longer instructed as masseurs, because when they are, they set themselves up as medical practitioners, unless I am misinformed.

The fallacy underlying this paper is the very common one, that a statute can free the world from evil, and the more complicated it is, the more likely it is to succeed. Dreams fade in the harsh light of practice.

The framers of the present Income Tax law shared that idea, and the country is groaning in consequence.

It may be well to admit that the present statute is not perfect, to take the ground that a bill cannot be drafted or outlined in general meeting, and to have the resolutions sent to committee.

Dr. Ellison Hillyer.

I feel as if the pendulum has swung one way, and then it has swung the other way, and I am a little disposed to take the mid-ground and let it stand still for a few minutes.

It would be almost impossible to take the paper and go over it as Dr. Carr has done without practically covering very nearly the same ground. I am just going to touch upon a few points to make clear the attitude of mind in which I am at present. The committee, of course,

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has not met yet. I regret that the members from Batavia and Syracuse are not here, for it has been stated to me this evening that this seems to be rather bringing the question out of its normal place and putting it in an abnormal place before the special committee has met.

That phase of the question had never presented itself to my mind, perhaps because I was not looking at it from that direction; rather from the inside of the committee than the outside. I confess that I feel ready to receive any kind of support or any kind of suggestion that shall remedy the condition which we certainly feel exists here to the detriment of our profession.

I know that every single member of the Second District Society fully appreciates the work that Dr. Carr has done for years, and never does this subject come up but what that sentiment is expressed. The work has been done faithfully and well. There have been criticisms, of course, but it is only a question of method, rather than of motive. I never have heard any other expression in any place or body that I have ever attended, and I have attended a great many.

As far as additional education is concerned, a post-graduate course is practically necessary. The law provides that we must graduate in three years; that is to say, providing a man meet the requirements. We need four years; in some cases we need a great deal more than four years, but if you realize what is demanded of the student who begins as an absolute novice, and that is the way a student is expected to begin, whether he has had previous experience or not, and then have him go through with three years of work, dividing it as it has to be divided. first year theoretical, second year partly technical and partially devoted to the scientific branches, and the third, when the practical part of it has the predominance—it simply is a drive from the hour the student enters until the day he graduates, provided he does his duty; and a great many fall far short of doing their duty, and you cannot make them do it, no matter how you may try.

Post-Graduate Teaching.

When it comes to post-graduate teaching, that is a very hard question to deal with. I confess that the step taken by the dental societies, in organizing study clubs for those who have been in practice, and who wish to develop along certain lines has been productive of great good, and will be, if properly carried out. It would be a very difficult matter, indeed, as Dr. Carr has indicated, to find out who should be the examiner of the teacher, or of the examiner, as he stated in his argument. That is a question that, to my mind, would be rather difficult to solve.

Dr. Ottolengui.

Are you talking about examining examiners or teachers?

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Dr. Billyer. I was talking about examining teachers—but as I say, it matters little how that might be done, so long as it is productive of good. As far as instruction by men—as Dr. Ottolengui referred to—who have taken up the work of demonstrating trade propositions, trade methods, and so on, it is hard to differentiate between one who is teaching and one who might be merely demonstrating methods; but there are methods and conditions which, as Dr. Ottolengui has said, are certainly very serious propositions; and methods that are being endorsed right and left to-day, and being used by a great many of us to-day which will in a few years be cast aside for other methods, of which we have inklings already.

State Board of Examiners. As far as the State Board is concerned, broad statements were made in regard to them, and I think Dr. Ottolengui made them in the kindest spirit. However, one statement I rather regretted, and that was that the Board of Regents was apparently dissatisfied with our present Board of Examiners. I do not think that was exactly the spirit in which that was intended when it was made last year, but a great many of us know that there was a reason back of that, which was purely political, and had nothing to do with the professional side. There was also a statement made that a great many men attend college who cannot graduate. I do not quite understand that; but the statement was made "who cannot graduate."

Dr. Ottolengui. I am willing to change that and say "ought not."

Dr. Billyer. I am perfectly willing to take it either way. A man enters college, matriculates; he attends his first year and his second year, and I have seen men who have gone through with their three years, to whom it would be a mercy if it were possible to say, "It would be wise for you to quit now; you never will be able to do the work." I have felt that was the case, and have watched them after they got out, and have been surprised at the persistency some have shown; and some have succeeded—not what I would term success upon the surface, but have really succeeded. In other words, it took a longer time for such a man to find himself than some of the others who succeeded perhaps more quickly. And who is going to be able to tell whether a man will succeed in the long run or not?

A statement was made by a member of the society not long ago, that he understood a large percentage of illegal practitioners of New York City, were graduates or students of our college. I cannot quite understand how that is, and I have traced it out as far as I can. I concede that a certain percentage of men fail possibly after their fourth or

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fifth examination, but there are not so very many of these, and it is not a very large percentage of any college; and I simply hope that there will come a time when we will be able to say as is planned now, that after the second re-examination a man may never come up again for his examination.

Dental Nurse.

You know my position in regard to the dental nurse, which I took two years ago at Albany. I confess that I am not ready yet to change my attitude in that regard. If we could have all of the changes that are outlined in this paper at once, I should be ready to fight for the resolution to endorse the dental nurse proposition; but as conditions are to-day, I believe that if we allow the dental nurse proposition to enter our law without the other changes outlined by Dr. Ottolengui, we might just as well do away with all our dental laws. Remember, they are not stipulated as female—the dental nurse is male or female; and if that were brought in without the other recommendations, all our illegal practitioners would be "dental nurses." I am heartily in accord with the idea of having the services of dental nurses, and I have been fully understood, I think, in that regard, as far as the office is concerned; but as far as the law is concerned, I believe it would be a great mistake to let that be the entering wedge at this time without the others.

Dr. Carr left out of his discussion one thing I hoped he would put in; that was the dollar annual registration.

Dr. Carr.

I am saving that for the committee. There are a number of things I am saving for the committee.

Dr. Hillyer: Annual Registration.

Now, gentlemen, what is the objection to an annual registration fee of one dollar for everyone of us? If any man has a better plan for raising funds, I have never heard it. I do not care whether the original proposition came from Dr. Ottolengui or from Kalamazoo; I claim that that provision would mean that we would have a fund of at least $5,000 a year, which could be appropriated for the sole use of prosecuting these illegal practitioners. If for no other reason, I would say that annual registration is desirable. As far as the registration is concerned, I think the arguments made in the paper in favor of it are perfectly sound. We do need to know who are practicing—at least who have the right to practice.

Censorship of Dental Advertisement.

As far as the censorship of dental advertising is concerned, that is a matter I have never particularly thought of. I have never had any great quarrels with the man who has advertised, probably because that is the least of all the evils, if the other evils could be cured.

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I regret if the reading of this paper seems inopportune to some. I think it was brought here in perfectly good faith, and with the idea of getting the opinions of those whom we are supposed to represent. The committee, when it goes into session, is not supposed to present its own opinions, but should voice the opinions of the men who are supposed to be back of it.

As to the Regents' licenses for post-graduate teachers, I should question the advisability of that at this time very seriously.

Dr. Barker. I want to express my unqualified approval of the proposed amendment which provides for annual registration, for the very reason mentioned by Dr. Hillyer—it provides a fund or capital with which the State Society can do business. It is not any exaggeration, and I have no fear of Dr. Carr contradicting me, when I say that the work of the Law Committee of the State Society has been hindered and handicapped and to some extent checked in the past thirty years by the lack of funds. The State Society has never capitalized its Law Committee. The Law Committee has had to depend upon an income which was irregular in coming and uncertain in amount, and oftentimes failed to come at all when it was most needed. Last fall we had a very hot time here one evening in regard to raising money to carry on that very work, and we were treated to the humiliating spectacle of our Law Committee passing around a hat and taking up a collection for the purpose of raising money to carry on their work. I am in favor of any proposition which will obviate any such unbusinesslike method of doing business.

There is one phase, however, of this matter of annual registration, which I want to call to the attention of the committee, because we men in the city do not come in contact with that phase. I refer to the loss and inconvenience which country dentists may be subject to in that annual registration. The mere annual fee is a small matter; but a man who lives a long distance from his county seat often has to hire a conveyance and drive ten, fifteen or twenty miles to register, and the loss of time and the expenditure are considerable.

For instance, we have several members practicing in the town of Peekskill. The county seat is at White Plains, on a different railroad, so that he has to take a train to New York, and then take another train from there to White Plains. It is an all-day job.

Dr. Ottolengui. The annual registration would be by mail, on blanks furnished by the proper officer.

Dr. Gough. Dr. Ottolengui has brought out a great many new points, but there was one in particular that struck me as being a little too drastic, and that is in

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regard to the licensing of teachers. A few years ago, a man who has done a great deal for dentistry as well as for organized orthodontia, wanted to have his post-graduate school in New York City, and there was so much opposition to it that if there had been any such law as this it would have been practically impossible for him to hold a session here or anywhere else.

Dr. Chaddeus P. Hyatt.

This subject is of the greatest importance not only to the general public, but to the proper standing which our profession shall maintain in the estimate of the public and of all other professions.

I agree with the essayist in what he says regarding the Board of Examiners, but I do not agree that the Board of Regents should be given the power to appoint upon the Board of Examiners whomsoever they may wish. I do, however, believe it would be desirable in these days, that examinations be held so that men with necessary qualifications should serve upon this Board. I would be willing to leave the selection of such men to the Board of Regents provided that they were restricted in their selection to members of the New York State Dental Society. My argument for this is, that all ethical members of our profession are eligible to membership in our State Society, and there must be good and sufficient reasons why any men practicing dentistry in this State have not become members of our society.

I do not like the idea of using the name "mechanical dentist." The name dentist should be used as much as possible in a higher sense and have attached to it more dignity. The work being done in our public educational campaign is adding more dignity to our profession, and the name "dentist" is too closely related with our personal services to have it associated with any form of work that is not personally related to the patient.

A "dental mechanic"* would be better. It would be just as logical to speak of mechanical surgeons, meaning those who make surgical appliances that are to be worn by the patient. I hope that a better name may be thought of or be created than the one used.

I trust that when the registry is made, that it will be arranged not only alphabetically, but geographically as well, so that we may glance at once to those streets in our neighborhood to see if those practicing there are registered.

There is no question in my mind that a law requiring annual registration such as the essayist speaks of would do more to abolish the

*Dr. Hyatt's suggestion was so good that before publication of the paper the term dental mechanic was substituted for mechanical dentist.—R. Ottolengui.

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possibilities of graft than any plan that has been suggested up to the present.

It seems to me that not only is it desirable to more clearly define "unprofessional conduct," but also to define in a legal way what shall be the necessary qualifications for a specialist.

We certainly are to be congratulated upon having the opportunity to hear the ideas of one who has been interested in this subject and who has the happy faculty of not only thinking clearly, but of expressing his thoughts clearly.

The paper is one that should be read and discussed in every District Society of this State and I shall move later that copies of the paper and the discussions, and result of action upon the resolutions, be sent to every District Society with the request that they also take action. Also that attention be called to the fact that within the First and Second Districts the greatest number of illegal practitioners are found, and that these Districts need the help of every other District in the framing and forming of such laws as will enable them to put an end to this state of affairs.

Dr. Johnson. There is one thing Dr. Ottolengui did not include in his paper; it is a crime to make burglar tools and allow them to be sold as such, and it should be a crime for dental manufacturing companies and supply houses to sell to illegal practitioners. I think that would cripple them to some extent.

Dr. Ottolengui. That is something I was saving for the committee. (Laughter.)

Dr. M. L. Rhein, New York. I trust that although not a member of your society, you will pardon my interjecting a word on this subject. It was refreshing to me to listen to Dr. Hyatt, because I believe we all sympathize with him. I think he voices the general sentiment of the large majority of dentists, that the present conditions are unendurable. I was surprised at Dr. Hillyer's view on this dental nurse question. It seems to me that the time has certainly arrived for serious consideration of this topic. I have been waiting for it for over thirty years. The value of hygienic conditions surpasses everything that we as dentists have to offer the public. It surpasses everything that the orthodontist has—every constructive work. Everything there is in dentistry occupies a place beneath a demand for oral cleanliness, and it has been pretty well demonstrated that the dental nurse is the only medium by which this blessing of dentistry can be given to the public. If what I have said is true, then it

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should make no difference if it filled the country with illegal practitioners.

In the State of Massachusetts, in fighting this measure, they make the ridiculous assertion that there are dentists to do this work, when there does not begin to be dentists enough to take care of the needs of diseased teeth—who, then, is there to teach the child how to prevent diseases of the mouth and how to keep the mouth clean?

It appears to me to be a most obsolete argument to say that the dental nurse will be a step toward the illegal practitioner. I have a dental nurse, and I defy the law committee and everyone else to prevent that dental nurse from exercising her duties—and anyone who has followed the use of the dental nurse will recognize the impossibility of its breeding illegal practice of dentistry.

I am sorry that Dr. Burkhart is not here to-night, because his name on the programme, to a certain extent, induced me to come here, and it was in reference to this subject of the dental examiners. If there is a weak point in our law, it is the method by which our dental examiners are appointed. It is the weakest point in the whole dental law, that which requires one examiner from each judicial district. This makes it possible that the appointment may be political pap, handed out to some man favored in his own particular district. Is this the way for a scientific body of men to have the dental law enforced? Someone has said the Regents are not dissatisfied. I tell you the Regents are very much dissatisfied. I say that from personal intercourse with the Regents on this subject.

The idea of the Board of Regents in regard to the dental examiners is not that the Board should be paid, as a Board, but as the essayist has suggested—one particular man on that Board, perhaps the secretary, should be paid a proper salary. He should be a man competent in every respect, not only theoretically, but practically—a man who should visit a dental college or a dental school, or a clinic.

Dr. F. C. Walker. The point seems to have been made that the present Board of Dental Examiners has been foisted on the Regents. Every dental examiner has been appointed as a choice between two men. No one man can be nominated; two names must always go together, and the Regents choose one. The chances are that one would be better than the other. If they were not satisfied with the present Board, the Regents could change it.

Dr. Killyer. I did not intend to take the floor again, after having said all I did. I was perfectly in earnest when I said that I am in sympathy personally with the idea

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as propounded by the most competent endorser of the dental nurse proposition, but I still adhere to the statement that in New York City, and this is the hotbed of our difficulties, if we have the dental nurse proposition legalized without the other changes in the law proposed by the essayist, and I am ready to endorse all of them, it would open up the way so that there would be nothing but dental nurses. The true nurse, such as Dr. Rhein is talking about, and the one I am speaking of, are two entirely different persons.

There is not a man in this room who could not have a dental nurse at his chair, exactly as Dr. Rhein has, and probably not offend the law any more than a man who stands on a street corner and converses with his neighbor, which, technically, is against the law.

Dr. Wright. I refrained from getting up before, because I did not want to have my remarks seem at all personal. However, I really feel it a duty to say what I have in mind. Dr. Hillyer, a few moments ago, said that many criticisms are made, but nobody offers a remedy. I think that has been the trouble largely with the dental law, that lots of criticisms have been made.

I was a little surprised when Dr. Carr read his discussion, that he was not wholly in sympathy with these recommendations which have been made by Dr. Ottolengui. I do not want Dr. Carr to feel that I am criticising him, because I respect Dr. Carr too much, and I am under the impression that Dr. Carr thinks that everybody has been attacking him as the head of the Law Committee. I think Dr. Carr has taken discussions of the present state of affairs a little personally. I am sorry if he feels that way, but there has not been any recommendation that I have heard that has been any improvement over this recommendation which Dr. Ottolengui has presented. If there is not any better, let us vote for this. If there is, let us drop this one and vote for the better.

Dr. Ottolengui. Speaking of remuneration of examiners, Dr. Carr said that to pay the examiners would be to increase the State's expenses with no certainty that the paid Board would be better than a volunteer board. This is true in once sense, but lawyers and medical men do not work for the State free in order to keep down the State's expenses. Why, then, should the dentists? He also said that an examiner who withdraws from practice would not be so competent as men in practice. This also is true, but I do not recall suggesting that the examiners should be restricted from practicing. Their active services are needed only periodically, but when

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needed they should be paid for: though I do believe that there should be a Board secretary who should devote all of his time to the work outlined in my suggested law.

Speaking of dental mechanics, Dr. Carr said that nothing would be gained by compelling them to register, and that it would not deter them from doing operative work. Dr. Carr misses my contention entirely. Under the present state of things, when an unregistered man is accused he sometimes evades the accusation with the assertion that he is only a mechanical dentist, and the duty of disproving this statement falls on the prosecuting officer. But if the dental mechanic were also compelled to register, then the question would not be, "Why are you practicing dentistry," but "Why are you not registered," and the duty of proving his status would fall on the defendant. My proposition deprives the unregistered man of one subterfuge, and at the same time swells the fund for prosecuting, by increasing the number who must pay registration fees. It also gives to the State a wider surveillance over all who practice dentistry in any form.

Dr. Carr says it would be difficult to delimit the sphere of mechanical dentistry. This is a woful begging of the question. The present law permits the practice of mechanical dentistry without requiring registration and license. If the State can permit the doing of a thing without a license, it surely can permit the same act to those who may be required to take out a license. In the bill advocated by Dr. Carr last year he tells us truly that there was an attempt to formulate a definition of dentistry; I will undertake to formulate just as good a definition of mechanical dentistry.

Just a word about inspectors. Dr. Carr said there would be no difference between inspectors and spies such as we have now. I think there would be a great deal of difference between a person who comes in and says: "I am an inspector; I am the man authorized to ask you why are you not registered," and a man who goes into an office and says, "Do you fill teeth? Will you fill my teeth?" and who then goes on the stand and testifies.

Now just a word about the dental nurse. I think Dr. Rhein is looking down on this from an aeroplane, and Dr. Hillyer is looking up. The facts are not as Dr. Rhein has stated; the facts are as Dr. Hillyer states them. The question of permitting dental nurses can only be considered in conjunction with my other recommendations. I want registration of everybody; the prophylactic assistant, the mechanical assistant every time he moves, the dentist himself and the dental mechanic.

Dr. Hyatt objected to the term "mechanical dentist." I gladly

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accept his suggestion and will adopt his term "dental mechanic" and restrict the word dentist to mean a regular practitioner. But all these people should be registered.

Dr. Johnson suggested that dental supply houses should be prohibited from selling dental goods to illegal practitioners, and recites the fact that it is a crime to make and sell tools to burglars. This is not analagous. It is against the law to make or sell burglar's tools, but it is not against the law to sell tools to burglars, because the tradesman cannot know that his customer is a burglar. In like manner we might prohibit dealers from selling dental goods to illegal dentists, but then we must furnish the dealer with some means of knowing that the customer is an illegal dentist. I feel certain that if the State will compel annual registration, and then prohibit the selling of dental goods to unregistered men, the reputable dealers would willingly comply with such a law. Therefore I think Dr. Johnson's proposition well worth considering. Having served as our law committee member he certainly knows something of the situation and he must think it serious to warrant such a drastic act. On the other hand, I have serious doubts of the constitutionality of such an act which would be in restraint of trade. Moreover, I believe we should do our own house cleaning and not ask commercial men to do it for us.

The discussion on the resolutions proposed at the end of Dr. Ottolengui's paper was postponed because of the lateness of the hour, and made a special order for the next meeting.

At the December meeting of the society the resolutions introduced by Dr. Ottolengui at the end of his paper were considered and after animated and lengthy discussion, resulted as follows:

"Resolved that the society approves of the plan for annual registration of general practitioners of dentistry." Adopted.

"Resolved that the society approves of the plan of registration of mechanical assistants, and of licensing and registration of dental mechanics." Adopted.

"Resolved that the society approves of the plan for prophylactic assistants." Rejected.

"Resolved that the society approves of the plan for revocation of licenses." Adopted.

"Resolved that the society approves of the plan for Regents licenses for post-graduate teachers." Rejected

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New Jersey State Dental Society.

Evening Session, Thursday, July 17, 1913, 8 P.M.

President Thompson. We will now take up the applications for membership and I will ask the Chairman of the Membership Committee, Dr. Kussy, to make his report.

(Dr. Kussy read the names of the applications for membership, but at the sugestion of President Thompson action was deferred until the last session of the convention—see proceedings of last day.)

Dr. Kussy. Mr. President, I move that these applications be referred back to the committee for their approval and that they be acted upon to-morrow morning.

(Motion carried.)

President Thompson. The next business in order is discussion on the paper read by Dr. A. E. Smith, Cleveland, this morning on the subject: *"Scientific Administration of Nitrous Oxid-Oxygen."** This discussion was postponed at the session this morning owing to the lateness of the hour. We have a great deal of business to transact to-night so that I will have to ask those gentlemen who discuss the paper to be as brief as possible in their remarks.

*Dr. Smith's paper appeared in the December number of ITEMS OF INTEREST.

Discussion of Dr. A. E. Smith's Paper.

Dr. J. P. Henahan, Cleveland. Originally the administration of an anesthetic was considered simply as a mechanical procedure, but to-day anesthesia is counted one of the important sciences.

It has made great strides since its discovery. Comparatively a new subject, I know of no branch of medical science which affords such a field for research, and many students are constantly engaged developing the knowledge of it.

The American Medical Association Committee on Anesthesia recently made its final report, after years of investigation. This report is a valuable document and should be carefully studied by all members of the profession.

The dental profession in the past have always been enthusiasts in the field of anesthetics, especially nitrous oxid and nitrous oxid and oxygen. Had it not been for their courage and perseverance, this most valuable anesthetic would have disappeared. The machines and appliances for administering nitrous oxid were all designed by dentists, and to-day the only machine for the administration of nitrous oxid and oxygen which

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is absolutely reliable is that designed and perfected by Dr. Chas. K. Teter, of Cleveland, Ohio.

At the present time, however, the dental profession stands in a serious situation regarding anesthetics.

This wave of enthusiasm has swept down upon us without warning and the public are becoming educated to the possibilities and are clamoring for anesthetics. In the future, the demand will be felt by all members of the profession, instead of by a few, as in the past.

Many dentists are now using anesthetics, but the great majority have still to embrace the practice. Why? Because of the lack of educational facilities.

Realizing this, the manufacturers of gas and machines are engaging in a campaign of education. Some of this education is carried on as well as could be expected from a commercial effort; but without a doubt some of it is actually pernicious.

One company is now flooding the country at regular intervals with postal cards which bear the most extravagant statements.

The impression which it has attempted to create is that scientific knowledge and experience are entirely unnecessary for the administration of nitrous oxid and oxygen, when their type of machine is used.

I consider this kind of advertising as the grossest of insults to the rank and file of the profession, reflecting as it does upon their very intelligence.

As I said before, the present wave of enthusiasm over anesthetics has swept down upon us rather than approached gradually, and, therefore, our educational facilities have been unable to develop with the rush.

On this account we find many members of the profession, ambitious men, alive to the importance of the situation and anxious to administer anesthetics, but at the same time realizing their unpreparedness to do so intelligently and scientifically.

What is to be done for these men? Some remedy must be found.

I believe this to be a problem for the professional organization to handle.

In the first place, the instruction in this branch in our dental colleges should be placed upon a more thorough basis, and, secondly, I believe that opportunity should be created which will allow practitioners to avail themselves of the desired knowledge.

I would suggest that the local dental societies take this matter up, and possibly organize classes. In this way instructors of recognized ability could be induced to give courses. There would be many advantages to the plan. The student would be at home, would be on familiar ground, and would gain more from the teaching, for this reason.

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It would allow prospective students to work up material for the class, and a man would see his own difficult cases successfully treated. In addition it would reduce the cost in both time and money to the student.

In his consideration of the subject of anesthesia the dentist, of course, looks at it from his own viewpoint.

The administration of anesthetics in the hospital and in the dental office are widely different practices. The conditions governing are entirely dissimilar.

For this reason the dentist upon taking up the study of this subject must first become familiar with what might be termed contributing conditions.

Importance of Suggestion.

Many things come under this heading. I believe the most important of all is the practice of suggestion.

This practice should ever be borne in mind by the man who administers anesthetics, for its successful application will be of more assistance to him than any other one thing outside of the anesthetic agent itself. It is really 90 per cent. of analgesia.

This is a broad subject which requires much study. It may be applied in a general way to nearly all patients, but must, according to circumstances, be made to fit each individual.

Upon coming in contact with the dentist the prospective patient begins to think and form opinions.

It is at this stage that the dentist must begin to apply his suggestion. He must lead the patient to formulate the proper opinions, and to think along favorable lines to prevent the formation of any unfavorable opinion concerning himself, his ability, his experience, his office, etc.

To permit this. 1st. The personality of the dentist is of the greatest importance; a pleasing, dignified bearing will be sure to gain the confidence of the patient at once.

The attire and so forth all come under this head.

The assistant and her personality come next. In all cases she should be a lady of ability and intelligence. Her assistance in the handling of women patients is invaluable.

About the office itself too much cannot be said. Its arrangement and its impressiveness all go to confirm the confidence of the patient in the man who is to perform the operation.

Preparation of the Patient.

The preparation of the patient is next in importance. Dr. W. H. DeFord's book devotes considerable space to this subject. All the prescribed precautions should be carefully followed out and upon

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commencing the induction of anesthesia the beginner should try to imitate someone whose technique he may approve.

There will always be cases of anesthesia which will be more troublesome than the average, but, as a rule, the patient will simply go to sleep and awaken upon the withdrawal of the anesthetic, when it has been scientifically administered.

There are two classes of troubles which we may meet: those which are simply troublesome but not dangerous, and those which may give cause for alarm; these latter, fortunately, are seldom met with, but should always find the anesthetist prepared to deal with them. These are the cases which are a true test for the man. He should remain cool, and go to work, for this is a time for quick thinking and not excitement.

I cannot too highly recommend Dr. DeFord's book on anesthetics to the dentist. Written by a dentist of vast experience in anesthetics its aim is the instruction of the dentist, and while there are many works on this subject which are more exhaustive, still I believe that every dentist, from the beginner to the most experienced, will gain in knowledge of this subject by a careful study of this simple little book, "DeFord's Lectures on Anesthetics."

Dr. Charles S. Cuttle, Philadelphia.

When I received Dr. Smith's communication, asking me to reply to his paper at the Asbury Park meeting, to say that I was surprised is putting it mildly, for it was my intention to get into a corner, listen and keep quiet. But it seems this is denied me, since a request from so able a man as Dr. Smith amounts to a command.

Dr. Smith, in his most interesting thesis, *"The Scientific Administration of N_2O & O,"* has so thoroughly covered the subject with plain facts and quotations from other eminent men interested in this work that it leaves little for one to discuss. It is my intention merely to emphasize a few of the valuable points brought out by this skilled teacher and anesthetist.

There is no doubt (as Dr. Smith has stated) that N_2O & O is one of, if not the most difficult, anesthetic to administer; at the same time the ability to administer this combination concerns the anesthetist and the operator (whether surgeon or dentist) far more than the patient, for, as has been shown in this paper, the post-operative effects of this anesthetic are entirely absent, or so slight as to be of little consequence. It has been demonstrated, not only by Dr. Smith, but by many other investigators, that a patient to whom N_2O & O is given goes to sleep easily and quietly, and during the period of operating, whether minor or major, the anesthetic itself tends to greatly lessen shock. Collins cites

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many cases to make this point clear. As has been stated, it has no harmful effect upon the leukocytes, therefore decreases the danger in cases where infection exists, and this point should be of interest to the dental surgeon, for have we not heard it said from time immemorial that an exodontic operation should not be performed where an acute abscessed condition exists? N_2O & O delivered to the patient in proper proportions has never been known to effect either the liver or kidneys, while it has been clearly shown that unfavorable changes do take place in these organs when ether or chloroform are the chosen anesthetics. Bevan and Favill have both shown conclusively the harmful effects of these two agents upon the liver cells, death having been recorded in several instances some days after the administration.

Two other points perhaps well worth mentioning regarding the N_2O & O combination are: First, the lack of throat irritation during the induction period, which other anesthetics produce more or less; and, second, the safety of frequent administrations of these gases at short intervals. In my own practice I have resorted to the nasal inhaler three or four times during a single dental operation, and with absolutely no ill effects upon the patient—nausea never occurring.

You will find another point in favor of this anesthetic, and that is the rapidity with which a patient recovers consciousness. In a recent experience, anesthesia lasting forty-five minutes, the patient sufficiently regained consciousness to bid me good-bye while being rolled from the operating room—certainly not more than eight minutes after the withdrawal of the face mask.

Definite percentages of nitrous oxid, oxygen and air are most essential when inducing analgesia, and if this is taken into careful consideration, the result will be satisfactory. In producing accurate percentages, the apparatus used plays an important rôle. It should be one having gauges and control valves between cylinders and bags in order to prevent the pressure from cylinders coming directly upon the bags, and also one which will insure a definite percentage of each gas per hour. In analgesia it is also most important to have an air control which may be readily adjusted. If this type of apparatus has been your selection, after ascertaining the required percentages, it may be so set and in almost every instance you will find it unnecessary to again bother about anything but the air admitted.

Suggestion.

A few words on positive suggestion and I will have finished. Since taking up this work I have made suggestion quite a study, and there are two words which I find it well never to utter to a patient, namely, "pain" and "hurt." I find that a suggestion containing either of these words

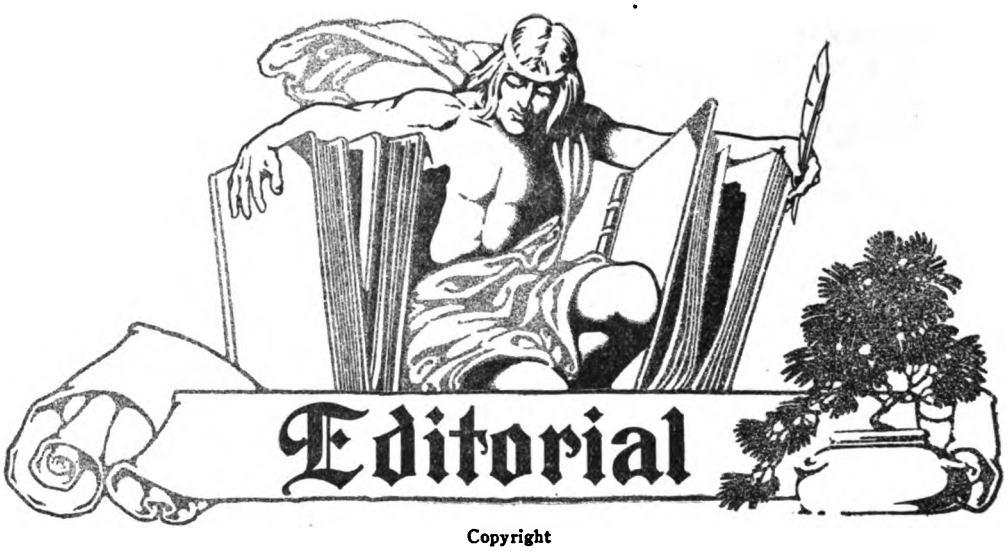
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presents the undesirable thought first, and that the patient is usually inclined to think he does feel pain or is hurt, since I suggest it to him. This is particularly true with the nervous person. He will apparently have agonized moments, convincing me of this by immediately moving about, wrinkling up his face and telling me he is being hurt; thus my aim is defeated. I find that by saying instead, "You are doing very nicely," "I shall soon finish and you will not know that I have been working on your tooth," "You are resting quietly, but please do not go to sleep, I prefer that you keep your eyes open," or something along these lines, I am enabled to produce a beautiful analgesia, and my patient returns to complete consciousness in a splendid frame of mind.

Concluding, allow me to thank you for this privilege, and I also wish to thank Dr. Smith for the paper he prepared for us on this most interesting subject. For one as busy as he is, it certainly means an immense expenditure of time and energy to produce such a paper. The administration of nitrous oxid and oxygen for the purpose of relieving pain during dental operations is uppermost in the minds of the men of our own, as well as many of the medical profession for their own work, and it is well to bear in mind that one should prepare himself thoroughly before rushing into this work. Also that the gas-mixing machines are not toys, and must not be purchased one day from a dental salesman to be operated the next without careful study, and what seems most essential to me, intruction under a capable teacher in this branch of anesthetics, at at least.

(*To be continued*)

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The New Volume: Its Purposes and Policies.

With this issue we are pleased to present to our readers the first monthly quota of a new volume, and we would respectfully call attention to the new dress prepared for the magazine, as well as to additional departments.

We have in the past had attractive department headings, but we believe that those herein contained are an improvement over those of the past. They are in more classic style, and it is our intention to make the material which they announce likewise a progressive improvement over past achievements. We say achievements, because we sincerely believe that ITEMS OF INTEREST has been a lever to lift up the practice of dentistry, and we take pride in the fact.

In addition to the familiar departments contained in the volume of last year, we have planned two new departments, which will be different from anything that ever before has appeared in dental journalism. One of these begins with this issue, under the title "Around the Table," for an explanation of which the reader is referred to the department itself. Another, which we hope to present for the first time in the February number, will be entitled "Exodontia." This will be the third specialty of dentistry given a place in ITEMS OF INTEREST.

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With the beginning of the 1897 volume we inaugurated a department for Orthodontia, and by this act believe that we did much toward creating out of this branch of dentistry a real specialty. A few years later, at which time there was no one specializing in what was then called mechanical dentistry, we coined the word "Prosthodontia," and established a separate department under that title. We announced then that if dental prosthesis was to advance it would be necessary to endow it with some dignity, that its practitioners might not be ashamed to admit the nature of their work. In this department we presented the remarkable series by Dr. Hart J. Goslee on "Crown and Bridgework," and the papers of the immortal Bonwill and others on the scientific articulation of teeth. To-day the art of prosthodontia takes its place side by side in importance with the practice of general dentistry, and its specialists are as much esteemed as the orthodontists.

Now the term "Exodontia" has been coined, meaning particularly the extraction of teeth. Dr. Winter has written an important book on this subject, using this title, and Dr. Winter has kindly agreed to prepare for us the article with which we shall open the department, probably next month.

The Policy of "Items of Interest."

We have perhaps never before said very much about what we consider our policy, and even now we shall fear to say but little, lest we seem boastful. But, whereas some journals are content to publish the articles which are offered, or which come in through societies, thus being, as one might say, simple recorders of current literature, we have never been quite content to follow such a path of inertia. When we have felt that a certain phase of practice might be exploited with advantage to the profession at large, we have used every effort to induce prominent and capable men to aid us in leading the dental mind into these newer channels.

We prefer not to recount the accomplishments of the past, because of these our readers are fully cognizant, but of the immediate future we may announce two special purposes as the leading factors of our present policy.

One of these purposes is the establishment of a better method in the practice of filling bicuspid and molar teeth. Dr. Black did establish

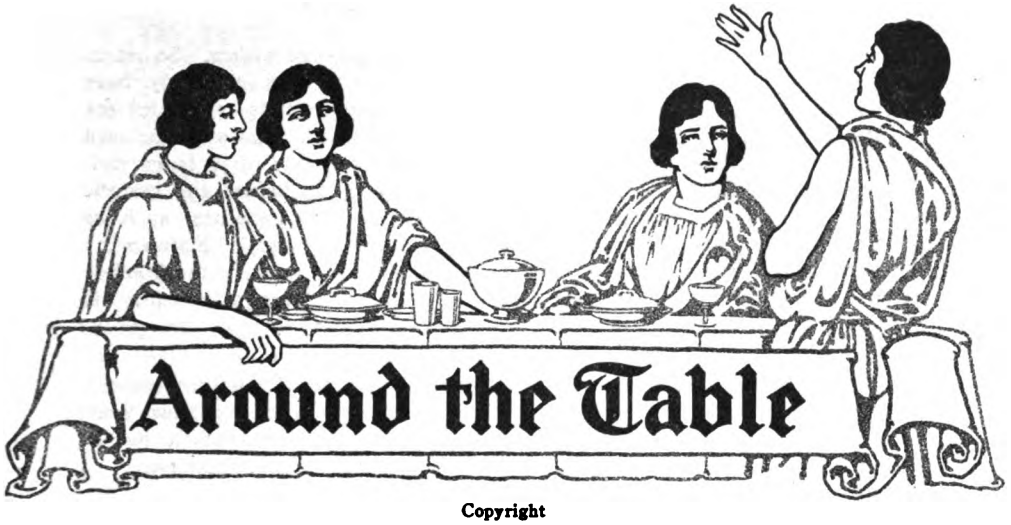
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the fact that a potent factor in the salvation of a tooth attacked by caries is the full restoration of approximal form and of approximal contact between contiguous teeth. As our readers know, we have already begun a campaign for a still further safeguarding of the inter-proximal tissues by the full restoration of the cusps and sulci, ridges and grooves which in nature are found in the morsal surfaces of the grinding teeth. It may seem to some that we have already printed enough on this subject, but really we have discovered an almost untilled field of dental endeavor, and with the plans which we have in view we do not hesitate to prophesy that within a year, or at most two years, State Society programs will contain innumerable papers and clinics dealing with the subject of the preservation of the patient's health by the restoration of the masticatory functions of his teeth. In this particular issue we are pleased to present a fine contribution from Dr. Pond, who makes a plea for the restoration of normal form with amalgam. The models presented by the author with his paper are really masterpieces, and important because they prove the possibilities. In this connection we would say in passing that during the past year we have found it extremely difficult to adequately illustrate these occlusal surface restorations. Recently we have come into touch with a photographer who seems to have the skill to overcome the obstacles. We think our readers will agree with us that his work on Dr. Pond's illustrations is very fine.

The other special purpose to which we dedicate this new volume is the improvement of dental statutes, with the end in view of so changing the laws that the conviction of illegal practitioners of dentistry shall be simplified. It has been truly said that no law ever written has ever eradicated an evil. But where the law has been sufficiently strong, and efficiently administered, evil doing has always been minimized. The main difficulty with the dental statutes of the past has been that there has been no provision made for their adequate administration. But this can be corrected in the future. Statutes can be formulated, must be formulated, which will render it possible for the dentists themselves to drive out the incompetents and the illegal men who are preying upon the public health.

To these two main purposes, and to the general improvement of dental practice, of the dental society and of the dentist himself, ITEMS OF INTEREST promises the full force of its influence.

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FOR YEARS we have wanted a new department in ITEMS OF INTEREST, but we have been very much in the position of the little girl whose father asked her, "What do you want Santa Claus to bring you for Christmas?" and who, after deep thought, replied: "I don't know whether to ask for a hobby-horse or a pearl necklace; but I guess I'll take the pearl necklace, because all the other children have hobby-horses, and I could ride theirs.

THE LITTLE GIRL certainly was a wise one, and we can't go wrong if we adopt her philosophy. Don't see the connection? Suppose we make it plainer. We have already a number of departments which, analyzed, come to this; we have been publishing articles prepared especially for us; articles read before dental societies; discussions thereon; reports of clinics, and editorials. All of these are important, especially the articles prepared exclusively for us, to which, as the great political parties always say in their ante-election platforms, "we point with pride." But important as they have been, and will be, the material in these departments has been scientific, serious, sedate and sometimes lengthy. For some reason, which is difficult to analyze, a certain proportion of the dental profession apparently are not quite contented with a dental journal, unless they can find in it some "short" articles.

IF WE PLACE our ear to the ground, Indian style, like a far cry across the dental desert we hear a demand for "short" articles. Not for practical articles; nor critical articles; nor humorous articles; nor news articles; nor in fact any particular kind of articles, except just "short" articles. There seems to be an almost pathetic yearning in the breasts of many dentists for short articles. Paragraphs that can be read between portions at luncheon, and digested, or indigested, as the case may be, along with the crackers and cream.

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BUT WE ARE wandering from our mutton—hobby-horse rather. So let us flock back to that noble stead. Well, other editors evidently have played Indian, and have heard the ten thousand dentists crying for the ten-line thesis. And they have supplied the demand. This much-beloved hobby of the so-called busy dentist has been brought forth from various journalistic stables, and put through his paces before the ecstatic throng, variously caparisoned, and under numerous names, such as "Timely Topics," "Dental Don'ts," "Practical Points," "Noteworthy Notes," etc., etc., and other aliterative aliases. But remove the blanket, and the blinders, and you will find this "Hobby" is always the same old horse.

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CONSEQUENTLY, like the little girl deciding about the Christmas present, we have concluded if possible to offer our readers, with the New Year, a different breed of equine. One that can trot around the track in just as short steps as the dear old "Hobby," but at a newer and faster pace.

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IN THIS CONNECTION you are probably wondering why this department is to be called "Around the Table." You observe that the title is not aliterative, and you wonder if, by lifting the new style of blanket, you would find that it hides the same little old animal. Well, you would not. You would discover that the time-honored "Hobby" has run his race, but that he has sired a promising colt—a prancing pony that will remind you of the pony-post horses of a hundred years ago, whose fleet feet carried the messages of the people to the far corners of the country. And it is our hope and belief that this swifter-moving son of a popular sire will make a good record carrying messages which, though perhaps short, will be as telegrams compared to letters; a compact expression of important facts.

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IN FURTHER ELUCIDATION let us explain more in detail why we have chosen the caption of this department. The scientists, investigators and writers of the profession naturally become widely known through their publications, and, as one might say, are "the big men in dentistry." Being big men, they write big papers; papers that occupy much space, and thus help to encourage the manufacturers of printer's ink, by using up their products. There is one curious fact about these big writers. Of course they have big ideas, but often they use such big words, and so many of them, that really it takes a lot of a fellow's time to separate the big idea from the lengthy language. And this perhaps is the main factor in the etiology of the fever for few-word papers.

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OF COURSE the editors can find those big ideas, and could prune away the wordy weeds, so that the big idea might be as conspicuous as a date palm in a desert. And sometimes they do this, these editors, working in behalf of those short article cranks.

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AND THEN, after the little editor has weeded and pruned the big article, so that the big idea is really comprehensible to the ordinary mind, Lo!

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The Big Man, the author, sends in a wireless, reading, "Let me see proof before publication," and there you are. The editor knows right off what is coming. But hoping for the best, he sends the big man his diminished article, praying that he might forget what he had written in the first place. But no! The zealous typewriter (or is she a typewritist?) has furnished that author person with a carbon copy, and, by George, he misses all the words that the editor had removed, and, worse yet, he replaces them. And worse yetter still, he interpolates a few extra adjectives, conjunctions and exclamation points, just to make the language a little more lustrous, and the meaning a little less lucid.

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MOST OF THESE big men read their papers before societies. Now these big societies have big men of their own, and of course they must have a chance at the visitor's big idea, if only to show him how little, or how old (usually twenty years old), or how useless it is. These local big men are all down on the programme, and are called on as soon as the visiting essayist stops reading his paper, and very often a local man's talk is twice as long as the paper. Usually there are two or three of these local professional discussionists on the programme of the evening, and by the time they finish up their "few remarks," the evening itself is nearly as much used up as the audience.

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THEN THE VISITING scientist closes the discussion, and tries to make those local men sorry they said so much, and sometimes he succeeds so well that the local men telephone to the secretary for the stenographer's report, and when they get it, they change it. It would be all right if they would alter these discussions with a pair of scissors, but that is not the common habit. More often the changes are made with pen and ink, a dictionary, and ten or twelve books of reference. This of course makes the discussion better, but also longer.

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AFTER ALL of the ideas, big and little, have escaped into the atmosphere of the meeting room, some one with a keen sense of appropriateness remarks from the back benches, "Move we adjourn," and thirty-odd men exclaim, "Second the motion." Then the entire six hundred and eight men present vote in the affirmative.

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ABOUT FIFTEEN MINUTES after the big meeting adjourns, the little meetings convene. Usually these meetings include small groups of four, six or ten men, and they hurry away from the formal atmosphere of the room in the Academy over to the more social air of the rathskellar or grill. Here they sit "Around the Table," and then, good friends, the paper of the evening is discussed—really discussed.

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MANY AN ESSAYIST has wended his way back home, pleased with the impression he had made, when in reality he knows nothing at all about the impression he may have left behind him. But if he could know all that had been said around the little tables by all the little men whose names never appear on programmes, and whose voices are seldom heard in the dissensions—I should say discussions—of the scientists, such knowledge would be enlightening.

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AND IT WOULD be useful too. Because these scientists are really working for progress; for the best interest of their profession. Let there be no mistake about that. If besides all the pleasant things, which the leaders in the locality of the meeting might say before their faces, these writers of papers could also hear what is said by the rank and file "Around the Tables" after the meeting, they could much better comprehend the value and possible utility of their efforts.

MOREOVER, these bashful, timid men, who never open their mouths in meetings, often have mighty good ideas—ideas that would be very acceptable to the majority of dentists if they could only get into print. Do you begin to comprehend the purposes to which this department is to be dedicated?

THE WRITER necessarily is present at a great many dental meetings, and quite frequently sits with those that gather around tables afterwards. For a long time he has known that hundreds of good and useful ideas are uttered at these circular sessions and never published. With the present department in view, he has been recording these practical suggestions made by practical dentists, and has on hand at the present time enough of such material to feel assured that this department can be made of interest and value for at least a year.

IN ADDITION to the notes gathered at previous meetings "Around the Table," and already filed away, we have the promise of co-operation from a number of men scattered about the country, so that the department will contain the "scraps from many tables," as it were.

MOREOVER, we anticipate assistance from our regular subscribers, and from you in particular, who are reading this message. Whether you are an experienced writer or a mere tyro, an old graduate or a new, remember that progress depends upon exchange of ideas. If a professional brother at any time has imparted to you a practical idea of any sort which has in any way lightened or lessened your work, you should share it with others. Or if you have by force of circumstances worked yourself out of a difficulty, and thus solved a problem in practice; or if you know anything apparently of little importance, but which you find of such usefulness to yourself that you would be sorry if deprived of the method, write the best description of the idea that you can, and send it to this department. Don't bother about the language beyond making your idea clear. Just remember that the idea itself is the important thing, and leave it to us to dress it up, if you prefer. Whenever you find an idea in this department which you consider useful, or whenever you know of a better method than one herein described, just imagine yourself sitting "Around the Table," with all your other brothers who are ITEMS OF INTEREST readers, and make your little speech, that you may do your share in making this department interesting and useful.

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National Society Meetings.

National Dental Association, Rochester, N. Y., July 7, 8, 9, 10, 1914.

American Society of Orthodontists, Toronto, Can., July 2, 3, 4, 1914.

Panama-Pacific Dental Congress, San Francisco, Calif., 1915.

National Association of Dental Faculties and Institute of Dental Pedagogics, Buffalo, N. Y., January 26, 1914.

State Society Meetings.

Arkansas State Dental Society, Little Rock, Ark.
Secretary, Dr. C. L. Hunt, Fort Smith, Ark.

Colorado State Dental Society, Manitou, Colo., June 18-20, 1914.
Secretary, Dr. E. W. Spencer, 120 Pope Block, Peblo, Colo.

Connecticut State Dental Association, Hartford, Conn., April 21-23, 1914.
Secretary, Dr. Arthur V. Prentis, New London, Conn.

Florida State Dental Society.
Secretary, Dr. Alice P. Butler, Gainesville, Fla.

George State Dental Society, Atlanta, Ga., June 4-6, 1914.
Secretary, Dr. M. M. Forbes, Candler Bldg., Atlanta, Ga.

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ILLINOIS STATE DENTAL SOCIETY, Chicago, Ill., March 23-26, 1914.
Secretary, Dr. Henry L. Whipple, Quincy, Ill.

INDIANA STATE DENTAL ASSOCIATION, Indianapolis, Ind., May 19-21, 1914.
Secretary, Dr. Otto U. King, Huntington, Ind.

KENTUCKY STATE DENTAL ASSOCIATION, Louisville, Ky., March 9-12, 1914.
Secretary, Dr. Chas. R. Shacklette, Atherton Bldg., Louisville, Ky.

MARYLAND STATE DENTAL SOCIETY.
Secretary, Dr. F. W. Drew, 701 N. Howard St., Baltimore, Md.

MICHIGAN STATE DENTAL SOCIETY, Detroit, Mich., April 9-11, 1914.
Secretary, Dr. F. Ward Howlett, Jackson, Mich.

MINNESOTA STATE DENTAL ASSOCIATION, Duluth, Minn., August 6-8, 1914.
Secretary, Dr. Benjamin Sandy, Syndicate Bldg., Minneapolis, Minn.

MISSOURI STATE DENTAL ASSOCIATION, St. Louis, Mo., April 21-22, 1914.
Secretary, Dr. S. C. A. Rubey, Warrensburg, Mo.

MISSISSIPPI DENTAL ASSOCIATION, Vicksburg, Miss., June 23-25, 1914.
Secretary, Dr. M. B. Varnado, Osyka, Miss.

MONTANA STATE DENTAL SOCIETY, Great Falls, Montana, June, 1914.
Secretary, Dr. F. W. Adams, 14-15 Chicago Block, Billings, Montana.

NEBRASKA STATE DENTAL SOCIETY, Lincoln, Neb., May 19-21, 1914.
Secretary, Dr. H. J. Porter, Cambridge, Neb.

NEW HAMPSHIRE STATE DENTAL SOCIETY, Weirs, N. H., June 17-19, 1914.
Secretary, Dr. Louis I. Moulton, Concord, N. H.

NEW JERSEY STATE DENTAL SOCIETY. Ocean Grove, N. J., July 15-17, 1914.
Secretary, Dr. John C. Forsyth, 430 E. State St., Trenton, N. J.

NEW YORK STATE DENTAL SOCIETY, Albany, N. Y., May 14-16, 1914.
Secretary, Dr. A. P. Burkhart, 52 Genesee St., Auburn, N. Y.

NORTH CAROLINA DENTAL SOCIETY, Hendersonville, N. C., June 24-27, 1914.
Secretary, Dr. J. Martin Fleming, Raleigh, N. C.

OHIO STATE DENTAL SOCIETY, Columbus, O., December 1-3, 1914.
Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

PENNSYLVANIA STATE DENTAL SOCIETY, Phila., Pa., June 30, July 1-2, 1914.
Secretary, Dr. Luther M. Weaver, Phila., Pa.

TENNESSEE STATE DENTAL ASSOCIATION, Chattanooga, Tenn., June 4-6, 1914.
Secretary, Dr. C. O. Rhea, 625½ Church St., Nashville, Tenn.

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TEXAS STATE DENTAL ASSOCIATION, Fort Worth, Texas, April 13-17, 1914.
Secretary, Dr. J. G. Fife, Dallas, Texas.
UTAH STATE DENTAL SOCIETY, Logan, Utah, June 19-20, 1914.
Secretary, Dr. I. P. Stewart, 1st Nat. Bank Bldg., Logan, Utah.
VERMONT STATE DENTAL SOCIETY, Rutland, Vt., May 21-23, 1914.
Secretary, Dr. P. M. Williams, Rutland, Vt.
WEST VIRGINIA STATE DENTAL SOCIETY, Huntington, W. Va., August 12-14, 1914.
Secretary, Dr. A. C. Plant, 802 Schmulbach Bldg., Wheeling, W. Va.
WISCONSIN STATE DENTAL SOCIETY, Fond-du-Lac, Wis., July 14-16, 1914.
Secretary, Dr. O. G. Krause, Wells Bldg., Milwaukee, Wis.

National Association of Dental Faculties.

The annual meeting of the National Association of Dental Faculties will be held at the Iroquois Hotel, Buffalo, N. Y., January 26, 1914.

Executive Committee meeting 9 A.M.; general session t 10 A.M.

B. HOLLY SMITH, Chairman, Executive Com.
CHARLES CHANNING ALLEN, Secretary.

First District Dental Society.

The third annual banquet of the First District Dental Society, of the State of New York, will be held at the Hotel Astor (Broadway and 44th Street, New York City), on January 24, 1914, at 6 P.M., to celebrate its forty-ninth anniversary.

All ethical practitioners are invited to attend.

DINNER COMMITTEE.

The Panama-Pacific Dental Congress.

The work of the Committee of Organization of the Panama-Pacific Dental Congress is rapidly assuming definite form, and the entire general plan of the Congress will shortly be announced.

The floor plans of the new Municipal Auditorium, in which the Congress will meet, will be sent to all prospective exhibitors within the next thirty days. The exhibits will be held in the main hall of the Auditorium, a room 190 feet square, affording ample space and light, and from present indications all of this great area will be fully occupied. It is planned to make these exhibits and their accompanying clinics one of

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the great features of the Congress, and they will, aside from the general program, afford a liberal education to anyone interested in modern dentistry.

Space in the Auditorium has been reserved for the general sessions of the Congress, and for the meetings of its sections, and also for the dental societies and fraternities which will meet in San Francisco during the Congress.

Three hundred thousand gum-stickers bearing the seal and date of the Congress will shortly be placed in the hands of dental dealers throughout the country, and every dentist who receives goods or letters from them will in this way be reminded that it is time to prepare for a trip to San Francisco in August of 1915 to attend the Panama-Pacific Dental Congress and the Panama-Pacific International Exposition.

Kings County Dental Society.

The first meeting of the Kings County Dental Society for the year 1913-14 was held at the Brooklyn Masonic Temple on Thursday evening, October 9, 1913.

The Chairman, Dr. Simon Shapiro, in his annual address reviewed the various activities of the Society during last year, and the progress it has made, and then spoke of the bright future he foresaw for it during the coming year. He laid particular stress on the excellent work accomplished by the Oral Hygiene Committee, it having succeeded in establishing a dental clinic in P. S. No. 109 in the Brownsville section of Brooklyn, where ten dentists of that section are giving dental services gratis to the poor children of that school. The outfit and supplies were obtained by voluntary contributions and the hearty co-operation of the Dental Supply Depots. Similar clinics for other sections of Brooklyn are being contemplated by the society and will be instituted in the near future.

The lecturer of the evening was Dr. Alfred Russell Starr, Professor of Operative Dentistry in the New York College of Dentistry. His subject was the preparation of cavities, paying particular attention to those for gold inlays. The paper was instructive, and appreciated by those present, judging from the attention he received and the applause. Dr. F. T. VanWoert discussed the paper. In a general discussion that followed Drs. Prensky, Nevin, Robbins and Herman participated.

THE EXECUTIVE COMMITTEE.

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The Sphere of Exodontia in Modern Dentistry.

By Dr. George B. Winter, Exodontist, St. Louis, Mo.

When considering the profession as a whole, it must be apparent to even the casual observer that the progress made in the extraction of teeth has not been equal to that made in most of the other branches of dentistry. Whatever the individual development may have been, it has not been general among the profession. I shall consider some of the causes of this neglect and the effect it has had on the advancement of dentistry, and give some reasons why there should be a more extended and concerted effort by the general practitioner, as well as by the exodontist for an advancement in the science and art of exodontia, an effort at least equal to that made in the other branches of dentistry. With the present civilization and probably for all time, the extraction of teeth, when indicated, will play an important part in the great work of preventing disease.

Dr. Ottolengui is to be congratulated for establishing a "Department of Exodontia" in his valued publication. This is an advanced step for a good cause. Such a department should be an excellent stimulus to the profession to put forth greater efforts in producing more literature on this subject, for by literature only may the department become general, and the exchange of ideas is the greatest aid to individual effort.

New Terms Necessary.

The development of science and art, like discovery and invention, presages a corresponding growth of language. New words that will convey a proper conception of whatever has been unfolded and

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brought to light must be supplied or much that is gained is subsequently lost. The development of specialties in dentistry have from time to time made of our language, a similar demand. For years there have been dentists who have limited their practice to the extraction of teeth. That this growth within the profession, one that has advanced until it is a recognized specialty, also demands adequate terms, few will question and none can deny. Without definite words by which ideas may be communicated, recourse is made to descriptions and definitions for this purpose. In this particular case, the use of such combinations of words as "extraction specialist"; "extracts teeth only" when spoken of; and, "I'm a specialist—I limit my practice to the extraction of teeth"; "I'm a specialist—I do extraction"; "I do extracting only," etc., etc., when speaking, are some of the forms of expression that have been in common use. Think of such titles for a profession or for one who practices a profession!

Exodontia Exodontist.

The building of suitable terms for this purpose, though apparently simple, has been proven to be to the reverse. Before presenting the word "exodontia" as a specific term to denote the extraction of teeth, and "exodontist" to signify one who extracts teeth, considerable time, extending over several months, was devoted to the selection of these words. The writer was not alone in this work, but was ably assisted by scholars of known ability in English, in Latin and in Greek. To take up in detail the various reasons for adopting these terms would interest but few, but I desire to say that they are the result of much thought and due deliberation, and that they were chosen with no less a motive than to offer the best to the profession. The selection is not an arbitrary one and, as to the writer, the field is open or any who care to labor therein.

Importance of Specific Terms.

The extraction of teeth is probably the oldest branch of dental surgery. Not alone is it the oldest branch, but it was the first branch to receive general attention over any great part of the civilized world. The spreading of this practice was especially rapid in the period following the invention of the "anatomical forceps," by Sir John Tomes, an English dentist, about the year 1840. So universal did this practice become, that teeth were "pulled" promiscuously by such pseudo-operators as the country doctor, the barber, and the village blacksmith. Broadly speaking, it was a form of avocation for anyone who happened to possess a pair of "tooth pullers." Such conditions, having been the common practice for years, and, existing in a less degree in some localities to the present time, afford a tangible reason for a form of corrella-

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tion that is more universal than it is the wont of the profession to admit; namely, that with the laity, dentistry and "the pulling of teeth," and the dentist and the "tooth puller," are very closely related subjects and individuals. This being the situation that confronts us, the adoption of definite terms for this branch of dentistry is another stride forward in the placing of our profession in its proper light before the public. This is especially true with the subject of extraction of teeth as the early abuses practiced here have caused a more general misunderstanding of dentistry and a greater apprehension of the dentist than possibly anything else. The sooner we become *exodontists* and practice *exodontia*, whether as a specialty or in general practice, the sooner this condition will be improved.

Exodontia a Neglected Subject.

While the extraction of teeth was the first branch of dentistry to come into general practice it is probably practiced in a more haphazard manner to-day, by the profession as a whole, than any of the other branches. In other words, it has not been given just consideration, with the inevitable result, that in the main, operations are performed to-day very similarly to the manner of operating a decade ago. I might go farther and say, without any considerable detraction from the truth, that there has been little advancement in this subject in the past half century, save what has been brought about by the introduction of anesthesia. This lack of growth is not at all strange when a study of the conditions that have led to the present development of dentistry are considered. The extraction of teeth was the primary branch of the old school of dentists. Next came the platemakers who attempted to restore, by artificial dentures, the masticatory function upon which the "tooth puller" had made great inroads. This method of providing a means of mastication, being only partially successfully in some cases, and a complete failure in others, there came a just demand to save the natural organs. Neglect and the almost universal destruction of the teeth by caries left them in a condition which necessitated the eradication of pathological disturbances and the restoration of destroyed tissues, if teeth were to be conserved and lost function restored. To do this required thought that would have built empires and would have developed skill that would have produced art worthy of a place in the most select galleries of the world, had it been so directed. However great the undertaking, the profession has been equal to the task and has developed artisans who have devised forms and methods of restoration so complete, that to-day few cases are presented in which excellent results cannot be obtained and function maintained or restored by modern dental art. Having advanced thus far, attention is now turning to mouth hygiene and

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prophylaxis. Present conditions place exodontia as an important adjunct to this good work and before I shall have concluded this article I will endeavor to show why exodontia should not be neglected and that when it is rightly practiced it occupies an important position in dentistry.

Failures in Exodontia.

Generally speaking, the preparedness and skill required for the removal of a tooth from its retaining tissues is greatly underestimated, and too little significance is given to the result of the operation. Of the different operations commonly undertaken by the average dentist, there are more failures in the extraction of teeth than the combined failures of all the other operations. If the diagnosis of the case indicates a crown, the tooth is crowned; if a filling or an inlay is the restoration undertaken, the filling or the inlay is inserted. A similar result prevails in all the other dental operations, with the one exception—extraction of teeth. This should not be. Exodontia is a surgical procedure and in its practice it is a branch of surgery in which operations are more frequently performed than in any other division of the surgical art and there are cogent reasons why the operation for the removal of a certain tooth from its retaining tissues should be performed with an equal degree of certainty as to the results of the undertaking as any other dental or surgical operation.

Causes of Failure.

Failure in any operative procedure is usually traceable to one of two causes, namely: the difficulty of the operation undertaken or to lack of skill of the operator. Under the latter is included all requirements necessary for the development of a skilful operator, such as a knowledge of anatomy, and pathology; and ability to diagnose local and general conditions and a thorough understanding of the operative procedure. In other words, there must be mental dexterity as a basis by which physical dexterity is rapidly acquired by practice. As operative skill is developed the cause of failure in difficult cases gradually vanishes, thus limiting the cause of failure in most cases to unpreparedness.

Exodontia Frequently Difficult.

This unpreparedness for the extraction of teeth is in no sense traceable to the inability of the profession to acquire operative skill in this branch of dentistry, but to three main causes, namely: First, the attention of dentists have been directed mainly to devising methods for restoring and improving lost function as previously mentioned. Second, the probable difficulty of the operation is frequently under-

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estimated. Third, the dentist does not fully appreciate the gravity of failure in an attempted operation.

The separating and removal of a tooth from its supporting structures, under certain conditions, demands of the operator, skill and resourcefulness second to that of no other surgical operation. The very nature of the tissues to be operated upon; the many irregularities encountered, and the innumerable pathological conditions that are presented, at times produce a veritable chain of difficulties that must be overcome if the operation is to be a successful one. I venture the assertion that, in the dental profession, there is a very considerable percentage of men who have never given this matter serious thought.

Greater Skill Required.

Before the advent of modern dentistry, little skill, compared to present-day standards, was required for the extraction of teeth. A tooth was seldom removed except for pain caused by pulpitis, and in such cases the crown usually retained sufficient strength by which the roots could be extracted. Following the death of the pulp, the tooth was seldom disturbed unless pain again intervened. This was not of frequent occurrence as pathogenic bacteria were not so prevalent, and their consequent infection so common as at present. The required removal of roots for artificial restorations; the splitting and peculiar fractures due to misjudged restoration; earlier excessive decay of the first permanent molars, due to present-day food standards, are some of the causes that are contributing to a more complete destruction of the teeth. After all, whatever may be said of the cause, the fact remains that the obstacles to be overcome in the practice of exodontia are on the increase, and to-day, in most cases, the teeth removed are those that cannot be restored to health and function. In such cases, the crowns of the teeth are usually destroyed, not to mention frequent pathological and numerous abnormal conditions of both the teeth and surrounding tissues that may intervene to militate against a successful operation.

Of the cases presented, not only are the number of difficult ones increasing, but the public is demanding better service of the operator. As is well known to every dentist, the advancement in civilization, with the added comforts and luxuries of life, calls for at least an equal improvement in dental procedures. This is not an unjust demand and the dental public is certainly just as much entitled to it in exodontia as in any other branch of dentistry.

Effect of Unsuccessful Operations.

The effect of an unsuccessful operation, so far as the individual is concerned, can often be surmised by the operator losing the patient, but whether the failure has left an impression so indelible in the

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memory of the unfortunate one that she never again seeks dental services, unless driven by pain to do so, is not commonly known. This being true, there is no standard of measure by which to determine the deleterious effect of such an occurrence upon the profession in general, but an assumption that every failure receive as great publicity as ten successful operations, is not at all presumptious. Without losing sight of the fact that failure in any one branch of dentistry has an almost equal effect upon all the other branches of the profession, by a little reflection, it is possible to form some conclusion as to just what failure means, not alone to dentistry, but to humanity in general. With his own interest, the interest of the profession and the good of mankind at stake, can any dentist conscientiously attempt an operation in which his skill is not commensurate with the undertaking?

Will Extractions Decrease in Number?

By the rapid progress made in dentistry in recent years it might be inferred that exodontia will sonner or later become a lost art, and that when the public becomes educated to the real province of dentistry, there will be no loss of teeth. This sort of advancement is to be hoped for and indeed it will be a dental millennium if it ever exists, but in the light of other conditions, there will probably never be such a day. The majority of diseases that effect mankind could be prevented, and with a universal education and a concerted action of the world, many of them could be entirely eliminated. Among them tuberculosis might be mentioned. To accomplish this would be of vital interest to every human being, but is it reasonable to expect it?

With exodontia and the development of a better operative ability by the profession in general, the number of extractions will greatly increase. Do not misunderstand me and form the conclusion that I advocate the removal of good teeth. No tooth that can be restored to health and function, or that can in any way be utilized in any form of restoration, should be extracted, provided the general condition of the patient will permit of this procedure or the retaining of the organ will not be deleterious to the general health of the individual.

A great majority of the people have never had the services of a dentist. Probably ninety per cent. of these have teeth that the destructive process has advanced to a degree where extraction is the only recourse. Such teeth usually afford the best possible way for the entrance of pathogenic bacteria into the system. Extracting these should be the first operative procedure. Of people who are accustomed to receive the attention of a dentist, a very considerable per cent. are wearing broken down teeth and roots that cannot be made to further subserve them, and no

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doubt in most cases they would be extracted, if the patient had a higher regard for the ability of the dentist to extract them.

Exodontia by the General Dental Practitioner.

Should the general dental practitioner be a skilled exodontist? The question is best answered by another question: Is the dental laity entitled to the best service obtainable? There are dentists who specialize in exodontia, and the number is constantly increasing. I am a firm believer in the practice of exodontia as a separate specialty, but every dental practitioner should at least have a technical knowledge of the subject, even though he does little or no extracting. This is required that he may give his clientele the best service, and when patients are referred to an exodontist, that he may at least know what to expect from him and understand the character of the operation to be performed.

There are also many cases that cannot be conveniently referred to an exodontist. These must have attention. Other cases—the so-called simple ones—may occasionally be undertaken, and if so, skill as an operator, at times, is not amiss, for nothing more effectively paves the way to confidence and further professional service than a simple extraction, skilfully performed at the psychological moment. For the dentist who desires to include exodontia in his general practice, that he should be both learned and skilled in exodontia is just as essential as for him to be qualified in any other branch of dentistry.

Unfinished Dental Operations.

By unfinished dental operations I refer to those innumerable cases where all that can possibly be done to put the teeth in good condition is finished, but the work is not completed. I will illustrate this apparent anomaly. A patient applies for dental services. All the teeth that can be conserved are put in condition, but there is one that cannot be restored so as to give further service. It does not ache, so it is saved (?)—left in the mouth. Why are such teeth allowed to remain? There can be but two possible reasons. The usual one is that the dentist is not sure of his ability to perform a successful operation, in which case he avoids the extraction for fear of failure and the loss of the patient; so the advice commonly given is that it is not necessary to disturb the tooth unless it aches, in which case it can be extracted. Or again, the patient has not enough confidence in the dentist to have the tooth extracted. With ability of the operator as an exodontist recognized the tooth would be extracted in the first case recited, and this very same ability would inspire the patient with confidence in the success of an operation, and the tooth would likely be removed in the second instance. In either case, an otherwise neglected mouth would be put in a healthy

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condition by the removal of a foreign body that is detrimental to the health of the patient.

Exodontia and Prophylaxis.

The attention of dentists everywhere is directed to mouth hygiene. Salivary deposits and other concretions are carefully removed. The surfaces of the teeth are polished. Disinfectants and various preparations for the toilet of the mouth are prescribed. This is a good work—none greater, but why is that broken down tooth here, or that partially submerged root there; those perpetual founts of pus pollution permitted to remain in that otherwise prophylactic mouth? Again I say, that no tooth that cannot be restored to health and function should be allowed to remain in the mouth. It should be removed by the operator or by an exodontist, and in either case skill, in keeping with the other dental operations, is indicated. If mouth hygiene is to reap its greatest reward exodontia will play an important rôle in the great modern movement for the prevention of disease by mouth sanitation.

Extracting and Root Extractors.

FREDERICK W. FRAHM, Ph.G., D.D.S.
Professor of Operative and Phosthetic Technic. Physical Diagnosis. Assistant to the chair of Anesthetics. Colorado College of Dental Surgery.

In almost every dental practice there is more or less extracting to be done, whether the practitioner really desires it or not. This is especially true in the smaller cities and towns, where no one specializes in this particular field.

The extracting surgeon may be ever so proficient in his technic if he has not the necessary and proper instruments at hand with which to do the work he is at a great disadvantage, causing a great deal of inconvenience to himself and annoyance to his patient. This is especially true at this time, when we are called upon to do the extracting while the patient is under the influence of an anesthetic, such as nitrous oxide or somnoform.

I have found this to be true, while I was conducting a practice that demanded a great deal of extracting to be done, and while assisting the chair of anesthesia in the Colorado College of Dental Surgery, of Denver, Colo., I was called upon to do the extracting as well as administering the anesthetic. Though I was well equipped with all the best patterns of forceps and root extractors that the market afforded, I was still lacking in root extractors. For during the period of anesthesia afforded by som-

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noform it is desirable to avoid any delay that would lessen the amount of work that could be done. This is also desirable during anesthesia by any of the other agents that are in common use at this time. We should strive as much as we can to avoid producing shock, or lengthening the period of shock, while still doing all the work possible at that sitting. This can be aided a great deal by using such instruments as will necessitate the least number of changes, so that you can keep your eyes on the field of operation. This is doubly true when extracting roots, or badly broken down teeth whose crowns are not strong enough to admit of the use of forceps. Difficulty is added to this work when we are extracting from

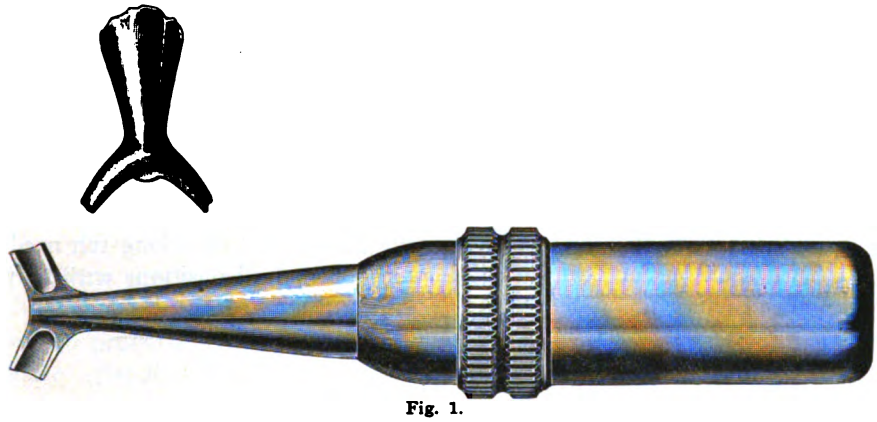


Fig. 1.

the mandible, for here we have the tongue, saliva and hemorrhage to contend with, the latter being especially troublesome in the majority of the cases under anesthesia.

When I was extracting roots on both sides at the same sitting under an anesthetic and had to exchange extractors once for each side, thus necessitating the loss of a fraction of time, a thing to be avoided where it is possible, since every moment means that many more roots extracted, many times I have wished for a right and left extractor on the same end of a handle, so arranged as to make it effective and not have any objectionable features. An instrument that could be used right and left, for anterior and posterior positions, also for action on the mesial and distal surfaces of the roots.

The Author's Root Extractor.

These features and others are embodied in an extractor shown in Fig. 1. It has been used by many, all of whom speak highly of its efficiency and convenience.

The extractor measures 5½ inches over all; the handle is 3½ inches

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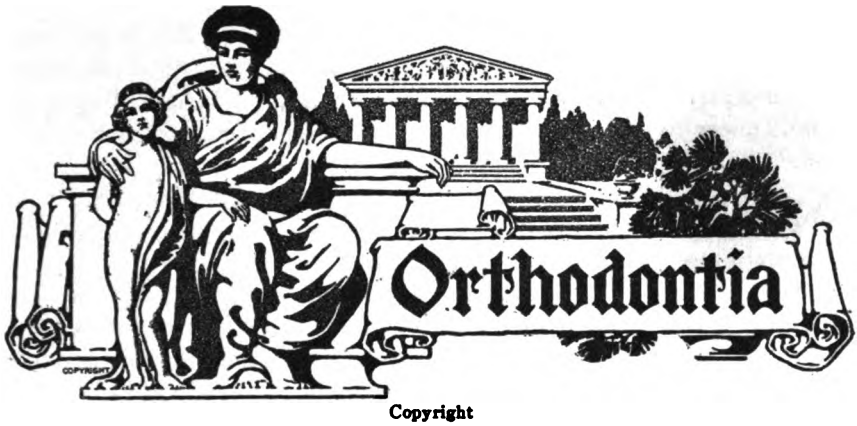
long and 1 inch in diameter. It is hollow and has a double knurl placed upon it 2¼ inches from the end, for the purpose of making an ideal grip for the strongest part of the hand, namely, the 1st and 2nd fingers.

The beaks and shank of the instrument are made of steel; it is screwed and keyed into the handle so that it cannot be loosened, no matter from which direction the force is applied. The real beauty of the instrument is the two beaks. They are set at an angle of 90 degrees to each other and at an angle of 65 degrees to the long axis of the shank. They are not very heavy; have a sharp edge, so that they may be very easily forced between the process and the root. This is facilitated by the beaks being concave on the inner surface. The end of each beak is also concave to aid it in grasping the root without the danger of having the instrument slip to the one side or the other.

The one great objection to a right and left instrument of this kind has been eliminated by having the beaks set at an angle of 45 degrees to each other. Thus when the one beak is in action and being rotated, the other beak will be out of the way and not obstruct the view of the field of operation.

I feel certain that such an instrument as this will fill a long-felt need, for with it extractions can be made from any and all positions with only the one instrument.

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Extending the Scope of Orthodontia.

By R. C. Willett, D.M.D., Peoria, Ill.

Read before the American Society of Orthodontists at Chicago, July, 1913.

Problems are ever confronting us, no matter where we may find ourselves on life's road, whether as individuals or as a society banded together to promote matters of mutual interest.

Since attending the meetings of the American Society of Orthodontists and my admission to membership, I find that there are other men here like myself who are confronting the problem of establishing an orthodontic practice in a city of less than one hundred thousand population.

In presenting this subject for discussion it is with a view to getting an expression of opinion from the older and more experienced orthodontists relative to extending the field of practice.

I entered the exclusive practice of orthodontia in a nearby larger city after ten years of general practice of dentistry in a city of ten thousand population, and it was there that I came to realize the true situation that confronts the conscientious dentist when obliged to consider orthodontic treatment for a child patient coming under his care.

Before I took up the study of orthodontia with a view to entering the exclusive practice elsewhere, my only idea was to eliminate the neglect and in a way give a more complete service to the younger patients where, for reason of age, it was not practical to send them away from home where they could be under the care of the specialist. It was through my preparation to do the orthodontic work required in my own

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general practice of dentistry that I became convinced of the opportunities existing to establish an exclusive practice outside of the larger cities. I will relate a little of my experience in attempting to establish such a practice and to extend the work in a new field. The one I choose I do not believe to be any different from any other section of our country under normal conditions.

Establishing a Practice in a Small City.

I sent out the usual formal notices to the dentists of my adopted city and also to those dentists in the neighboring counties.

The matter of getting the people to concede to my demands in payment of a sufficient fee to enable me to properly carry on the work, or to convince them of its importance, has not been my greatest problem by any means. It has been the weeding out of false ideas in the minds of the dentists, as well as the laymen, which are contrary to all modern orthodontic principles.

Soon after sending out the announcement that I had discontinued general practice, and would in the future limit my practice to orthodontia, I was receiving models of cases of every description. In almost every instance they were those of patients far removed in years from the age we find it most practical to treat. The ages ranged from fifteen to thirty. Many of them were cases where a well-meaning and conscientious dentist had advised waiting, or where the case had been mutilated through extracting teeth. The idea of beginning treatment at an early age seemed to have been the furthest from the minds of the dentists.

Frequently these out-of-town patients were referred and came themselves with great hopes and expectations of receiving a much-needed service, but for which they were coming too late in life. These same conditions confront the orthodontist more or less in all parts of the country, I do not doubt, but the fact that such ignorance relative to orthodontia does exist would make it seem that in limiting orthodontia to exclusive practice the great benefit in our work has been at the same time limited to a selected few, and untold thousands are neglected.

The patients were coming from representative dentists of the smaller towns, dentists I well knew to be far above the average in other lines of general practice. Many of these dentists had given me great encouragement to enter orthodontic practice, and it was evident to me that if they were interested enough in orthodontia to refer permanent dental cripples who were ready and willing to pay well for any service that might benefit them, some effort should be made to direct their attion to the child patient of an age where we are in a way able to assure results.

It is possible that my sympathy is more with the smaller city and

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village dentist than some, having practiced myself so long in like localities. For that reason I cannot believe, as one well-known orthodonist and teacher has often said, in speaking of dentists of the smaller city, that it is a problem for the dentist to work out for himself, and not one for the orthodontist to have very much to say about, and at the same time this man expresses anxiety for fear that the dental profession will do more to retard than promote the progress of orthodontia.

Being located one hundred and fifty miles from any other orthodontist in exclusive practice, I felt that I would not be overstepping the rights of a fellow practitioner if I undertook a scheme of my own to change the character of cases that were being directed to me. At the same time I hoped to instil something in the minds of neighboring dentists to counteract the early teaching relative to the work. I selected the names of one hundred and fifty dentists from the neighboring towns, to whom I had sent announcements when I entered exclusive practice, and mailed to them a letter, in which I spoke of the most desirable age at which the orthodontist of to-day desired to receive patients for treatment. I also suggested a plan of co-operative treatment through which we might overcome the inconvenience to the younger patients, where distance was a serious obstacle to my taking the individual care of the case.

The result of this letter was not altogether spontaneous, but is slowly showing its effect. During the six months following the sending out of that letter I was invited to take part in seven different meetings of neighboring district societies. As a subject for essays before these smaller societies, where the attendance was from twenty to thirty-five members, I avoided anything of a technical nature. The following is a partial list of subjects selected:

Orthodontia Papers before General Practitioners.

1. "That Phase of Orthodontia Not a Specialty." In this paper, the importance of making an early diagnosis and the dentist's duty in seeking the casual factors that might result in later anomalies of development was discussed.
2. "The Relation of Orthodontia to General Practice."
3. "An Important Relation, Dentistry, Orthodontia and Rhinology." This paper was given more as a symposium between a rhinologist and myself.

My attempt was only to give them something of the fundamental principles upon which the orthodontist of to-day is working. The importance of observing the early development of irregularities, diagnosis of the various types of irregularities, and their etiology.

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At these smaller meetings the essayist can get closer to the dentist and get the attention of many men who would skip all papers pertaining to orthodontia at a State Dental Society meeting, and who would never get into an open discussion following the reading of a paper. Here they enter into the discussion and ask questions. There are no side attractions nor extensive programs from which they may select such subjects as may interest them.

I realize that the subject matter presented at these meetings had been gone over many times before and many times better written by gentlemen present than I could ever do it, but how few dentists have grasped the idea as set forth in the published article, even if it has been read? Here I was able to tell it so that I could be understood and keep away from the technical features of our work, besides answering questions as they came up in the discussion.

I wish to say that the result of these meetings which I was invited to address has to a great measure changed the character of cases I am now receiving from out of town.

The notion that only a few of the cultured people of wealth in the cities will avail themselves of the services of an orthodontist is a mistaken idea. Our field is just as broad as that of higher education. They go hand in hand. Our service adds to the personality, the health and happiness of the individual we serve, and without that what will the child's future be?

Discussion on the Paper of Dr. Willett.

Dr. C. L. Grisamore, Chicago.

I wish to compliment the essayist on his paper, and I want to say that he has been one of the few men who has had the courage to go into a country town or small city and limit his practice to orthodontia, and I think in so doing he has proved to this section of the country, at least, that orthodontia can be practiced in other places besides large cities like Chicago, New York, St. Louis, etc.

He made one point in his paper that I would like to emphasize, and that is with regard to appearing before general practitioners with papers on orthodontia. It is true, that as soon as you announce the title of a paper on some topic in connection with orthodontia, three-fourths of the audience will immediately leave the room; that is an audience of general dental practitioners. That has been brought about largely, I feel, by men who have read papers and have tried to report the most difficult cases they have had. They have tried to show the wonderful things they could do, instead of trying to show the general practitioner the

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more simple things that they can do, and I think, possibly, we are at fault largely for the way the general practitioner feels regarding papers on orthodontia. If we were to take up the simple points, as Dr. Willett has suggested, and dwell on them, instead of talking about our difficult cases, these dentists would receive our papers with better grace and would be glad to hear papers from orthodontists.

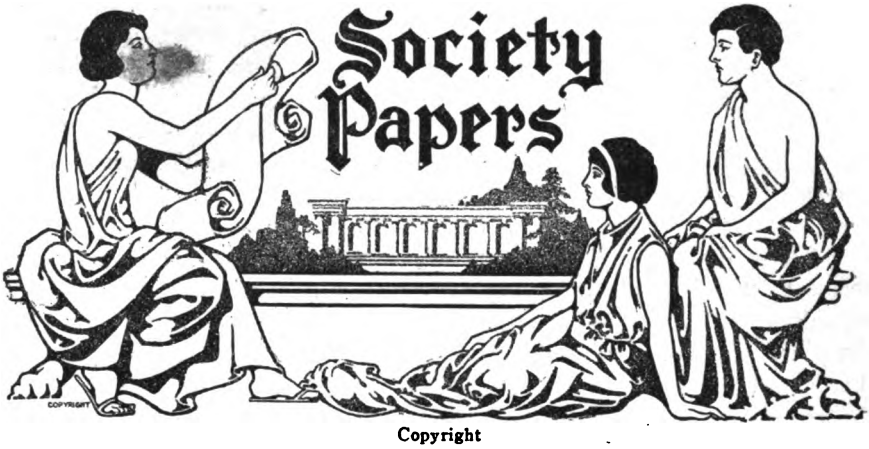
Dr. Grafton Monroe, Springfield, Illinoi

I want to say that I am a confrère of Dr. Willett, and have been working along the line of exclusive practice in orthodontia, but have not gotten to the point where the doctor has as yet.

Along the line of getting people interested in young patients, it seems to me that this is a very important phase of the subject under consideration. Those who are engaged in the regular practice of dentistry are very apt to advise delay in sending young patients to an orthodontist. I have repeatedly had folks come to me with children, with the report that their dentist had said "let the child alone; there is time enough to commence when the child has all the permanent teeth in the mouth." We all know how erroneous that is. In my feeble efforts I have been dropping a word at dental meetings, pointing out the importance of early correction, and I find dentists are beginning to comprehend, and a number of patients are being brought in now at a much earlier age, whereas formerly the older ones were the only ones we had.

This paper is worthy of our commendation, and I think Dr. Willett is working in a field where he will help all smaller towns and help those who want to go into the work in smaller towns.

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"Surgery of the Jaws."

By Henry Sage Dunning, M.D., D.D.S.

Visiting Oral Surgeon, New York Hospital; Attending Dental Surgeon, Vanderbilt Clinic, College of Physicians and Surgeons; Director of Oral Surgery Department, New York College of Dentistry; Clinical Assistant, Manhattan Nose, Throat and Eye Hospital.

Read before the Second District Dental Society, October, 1913.

I shall not try to cover all the surgical conditions of the jaws this evening, for that would take too long, and, I am afraid, would involve us in too many deep problems that cannot be answered in one sitting.

My aim to-night is to point out to you the importance of oral surgery, to give a sort of outline of the work included in this field. The oral surgeon is "the missing link" between the dentist and the surgeon. I believe I have charge of the largest purely oral surgery clinic in this country, at the New York College of Dentistry. The clinic, under the direction of Prof. Faneuil D. Weisse and myself, has been for a number of years a sort of "clearing house" for all kinds of jaw cases from nearly all the hospitals of Manhattan, and some from Brooklyn. In the last seven or eight years we have treated over 1,100 cases of fracture of the jaws. Up to within the past few years diseases of the mouth and jaws have received very little attention at the hospitals. Very few of our institutions have had competent dental surgeons on their staffs, and the poor of our great city have had rather meager treatment for diseases of the buccal cavity.

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Cases Created in the Clinic.

Up to a few years ago, when a jaw case presented at one of the hospitals, the house surgeon would ship him, like a case of measles, or some other unpleasant disease, to old Bellevue. Here the patient would reside for a week or so, and then be shipped again, with a Barton bandage on his head and a bottle of mouthwash in his pocket, to the dental school.

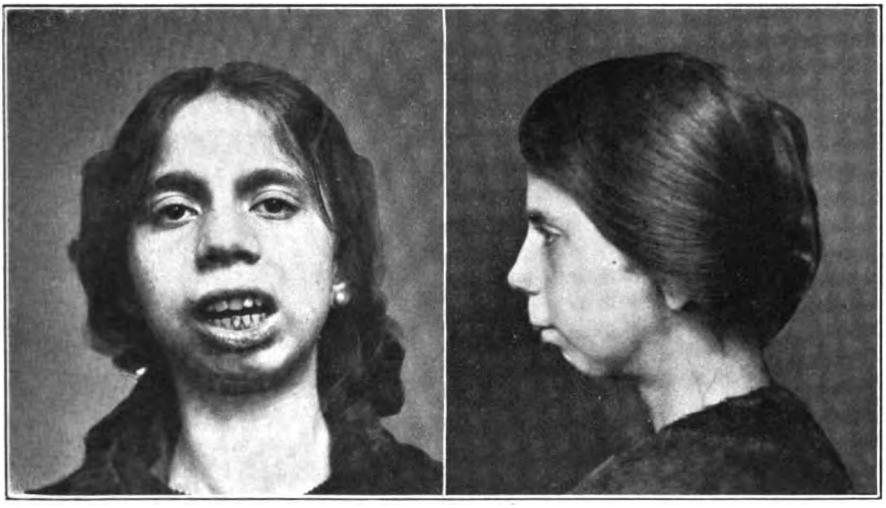


Fig. 1. Fig. 2.

We are receiving daily, from the hospitals and from physicians and dentists, cases of fracture of the maxillary bones, alveolar abscesses, advanced cases of pyorrhea alveolaris, necrosis of the jaws, impacted and abscessed third molars, dentigerous cysts, ranula, lymphadenitis, osteomylitis, syphilitic lesions of the mouth, maxillary sinusitis, temporomaxillary dislocations and ankylosis, different forms of stomatitis and glossitis, epulis, fibroma, sarcoma, epithelioma, and osteoma, etc. Neuralgia of the fifth cranial nerve, cleft palate, harelip, etc.

Most of these cases require special treatment, and come under the head of oral surgery, a specialty of medicine which is as important as that of rhinology, otology or opthalmalogy, but which has received little recognition. The day has passed when ruthless extraction of the teeth, under septic conditions, is practiced, and mouth infections, and other diseases of the buccal cavity, are ignored. The extraction of a tooth, or the treatment of an abscess of the jaw, is as much a surgical operation

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as the amputation of a finger, and should be performed under careful surgical technic.

Importance of Oral Surgery.

I am anxious to see the practice of oral surgery placed on a more scientific basis. The surgery of the mouth is important work. The mechanism of the jaws is complicated, and, like other complicated machines, gets out of order easily, when subjected to injury. The func-



Fig. 3.



Fig. 4.

tions of the jaws, teeth, gums, tongue, salivary glands, lymphatics, etc., are of the utmost importance to the entire system, and their importance is being recognized more and more by the physician, by the surgeon, by the dentist and by the patient himself.

I believe that diseases of the mouth, and surgical conditions of the jaws, have been greatly neglected and overlooked by the medical profession and the dentist. Two incidents of last week go to prove this contention.

Example of Bad Surgery.

One example of the disregard for the mouth was plainly brought to view by a surgeon of prominence, whom I was assisting in refracturing a jaw. It was a case of an old neglected fracture of the lower jaw, of about five months' duration. The fracture was between

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the second bicuspid and molar, firmly united, but in a faulty position, and only the molars of the upper and lower jaw articulated. The jaw had to be refractured to obtain normal occlusion and to restore the function of the teeth. The surgeon, in his haste, used a large bone-cutting forcep, such as a tinsmith might use, to bite through the bone. He exerted tremendous force on the instrument, there was a loud snapping

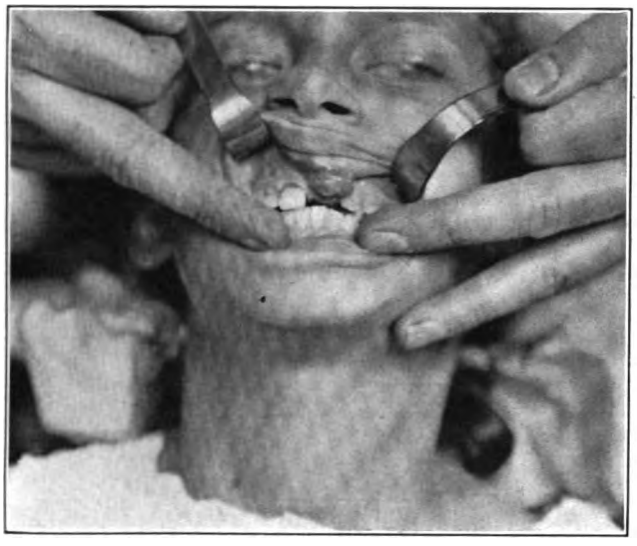


Fig. 5.



Fig. 6.

noise, two teeth were knocked out, and the bone so badly splintered that union of the parts would not have taken place for about a year, had the patient survived. He died shortly after leaving the operating room from hemorrhage. Notwithstanding the fact that the operator was a good general surgeon, he performed a careless operation, and one that showed a lack of knowledge and a disregard for the tissues he was working upon. He laughingly said, as he knocked out two perfectly good teeth during the operation, "There will be a job for a dentist when we get through." If he had been operating on the nose, or some other part of the body, he would have taken the utmost care to preserve all the tissue he could, but any sort of treatment seemed to be good enough for the mouth.

There should not be any force used in refracturing a jaw. The soft parts should be carefully dissected away from the bone at the point of fracture, and then the united ends of bone should be separated by means of a thin saw.

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Another example of poor surgery of the jaws came to my notice recently, when a young patient presented at my office with a large sloughing epulis. I noticed a very foul odor when she came in, and before looking at her mouth, I asked her what was the matter. She said, "Oh, that is a tumor in my mouth. My doctor tied a string around it over three weeks ago, and told me it would slough off, but it has not done so yet." I was speechless with surprise for a moment, to think that in these days



Fig. 7.

of antiseptic surgery, that in these days of mouth hygiene, a foul, infected, decaying mass should be allowed to remain in a mouth, with a string tied around it, until it fell off or "walked away" of its own accord. This patient would be sure of a recurrence even if the epulis had sloughed off, and think of the amount of toxic substances that this patient had been needlessly absorbing during the previous month from this broken down tumor, when her condition might have been relieved in a few minutes with a knife and a Rongeur forcep.

I am constantly seeing cases of abscess of the teeth, often leading to necrosis of the jaws, that are not recognized, fractures that are not treated properly, maxillary sinus infections that are not cured, and many other surgical conditions of the mouth and jaws that are overlooked. It seems to me that the time has come when the diseases of the mouth, and the surgery of the jaws, should form a large part of the student's

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education in the medical and in the dental school, and that the medical practitioner and the dental surgeon should work more closely together to improve oral conditions, and to better understand the treatment of disease in this region.

The lantern slides that will be shown upon the screen are from photographs and radiographs of actual cases that I have treated at the various hospitals and clinics of New York, and in my private practice.

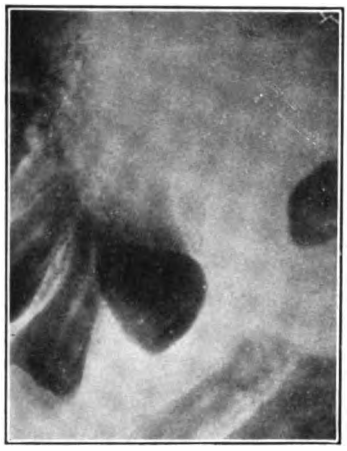


Fig. 8.

Some of the conditions of the jaws were congenital, many were the result of trauma or injury, and other conditions were due to disease, following either neglect of the mouth or faulty treatment.

Cases from Practice.

The first slide (Fig. 1) shows a young girl, fifteen years old, who was suffering from a true bony anklylosis following a fracture of the neck of the condyle of the inferior maxilla, the result of a fall while a child. Fig. 2 is the profile of girl, showing marked displacement backward of entire mandible. History: Patient fell out of a tree when she was nine years old, and was told that she landed on the point of her chin. She was picked up unconscious and was in the hospital for several weeks. At the time of fall her mother says she had considerable bleeding from her ears which probably indicated a slight fracture at the base of her skull, probably due to the forcing of the condyle of the jaw into the glenoid cavity, and rupturing some small blood vessels in the region of the external auditory meatus. The hemorrhage stopped shortly and no other symptoms developed except that her face and jaw were painful. She was discharged from the hospital, and the doctor said she

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needed no further treatment. Shortly after this she found that the motion of her jaw became somewhat limited, and after a time, about two months, she could not open her mouth more than about one-quarter of an inch, as shown in Fig. 1. Her lower jaw became more rigid as years went by and she became accustomed to living on soft, semi-solid food, as she could not masticate with any success. Fig. 2 shows profile



Fig. 9.

and position of lower jaw as it was forced backward by the fall six years before, when the condyle of jaw was fractured. A radiograph was taken and it showed that there was a mass of new bone around the condyle and joint, on the left side. She was admitted in New York Hospital, and Dr. Hitzrot and myself made an incision over the zygomatic arch and exposed the temporo-maxillary articulation. We found that there was a tremendous growth of new bone that seemed to glue the condyle to the glenoid cavity. There was also a large amount of new bone in the sigmoid notch, in front of the condyle, and it looked as though the condyle had been displaced into the sigmoid notch and a callous had formed and new bone had cemented the displaced condyle in this position. A chisel was passed between the glenoid cavity and the mass of bone surrounding the condyle, and then a gigli saw was introduced and the entire condyle and also part of the coronoid process was removed. A space of about a half an inch was made between the ramus and the

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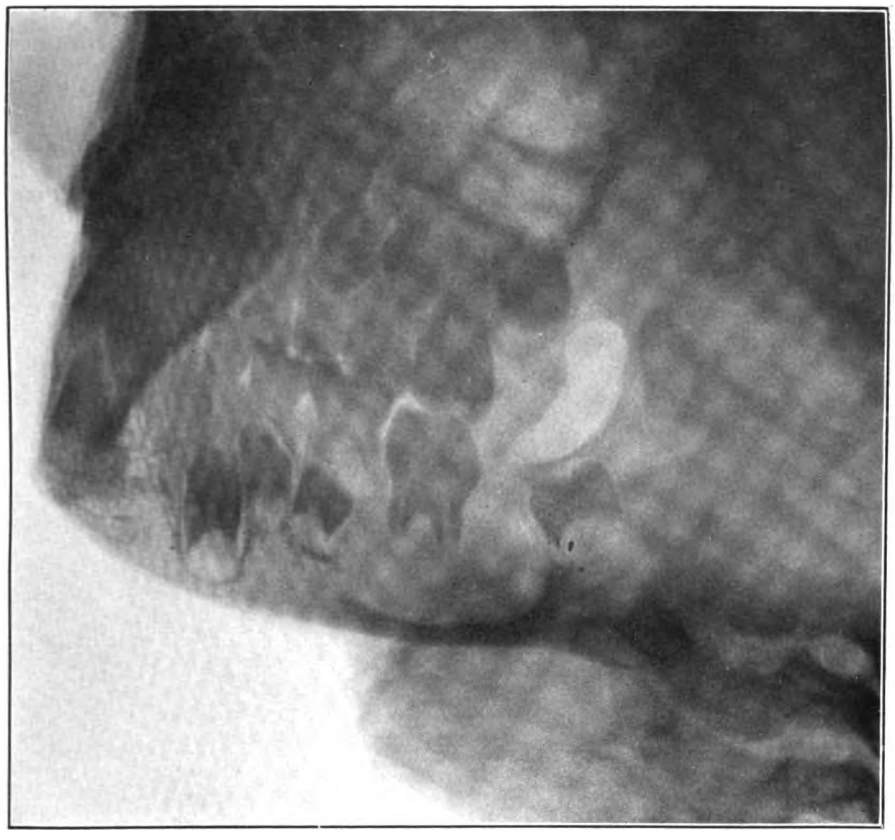


Fig. 10.

glenoid cavity and a new joint was constructed. The wound was closed up and the patient left the hospital in a few days. Fig. 3 shows final result. Patient now has perfect movement of lower jaw.

Fig. 4 shows an interesting lower third molar which has partly erupted, and one which I endeavored to remove without the aid of a radiograph. Luckily for the operator, the patient was in a hospital, for quite an extensive bone cutting operation was necessary before the tooth could be removed. The tooth looked very innocent and I thought, of course, I could remove it under novocain in a few minutes. After cutting for about half an hour without being able to remove the tooth I decided that it must have unusual roots, and obtained a radiograph which showed two curved roots that hooked upward and posteriorly in the ramus. With the help of the radiograph, under ether, at a subsequent operation, I removed the tooth after freeing root by means of surgical bur and chisel.

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Fig. 5 shows a young girl of eight years with a small epulis of upper jaw. The growth had been present for about six months when the photograph was taken. It was quite hard, smooth, very vascular, and was attached to the periosteum of the alveolus of central incisor region. It was removed by the author in the hospital, and the cause of this growth was found to be due to irritation from a central incisor bent

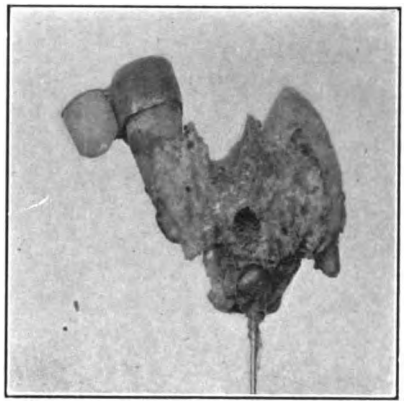


Fig. 11.

upon itself at right angles, the morsal or cutting edge projecting into the gum tissue. It was a simple fibroma. It was thoroughly excised. Fig. 6 shows the deformed central incisor.

Fig. 7 shows a malignant round cell sarcoma of upper jaw in a young man of eighteen. This growth was about eight months old when the photograph was taken. It had originated from a small epulis surrounding a first molar. It grew rapidly from the start, quickly loosened all the teeth up to the first bicuspid, and they fell out about the sixth month. The growth was extremely vascular and bled very easily. It became broken down and ulcerated very early, and presented a foul-smelling, sloughing mass. It was treated by the X-rays, radium, and other agents, but was not improved. It was thought to be inoperable, but was removed by Dr. Wm. Downes, at the General Memorial Hospital. The patient was in pretty fair condition, although he had lost about fifteen to twenty pounds. Dr. Downes split the lip at the medium line, carrying his incision up around the side of nose, up under the eye to the outer canthus. By this incision the entire face was laid open. A thin saw was then passed through hard palate into nose, separating the median suture, the soft tissues covering the external surface of the body of the superior maxillary bone were reflected and a thin saw was passed

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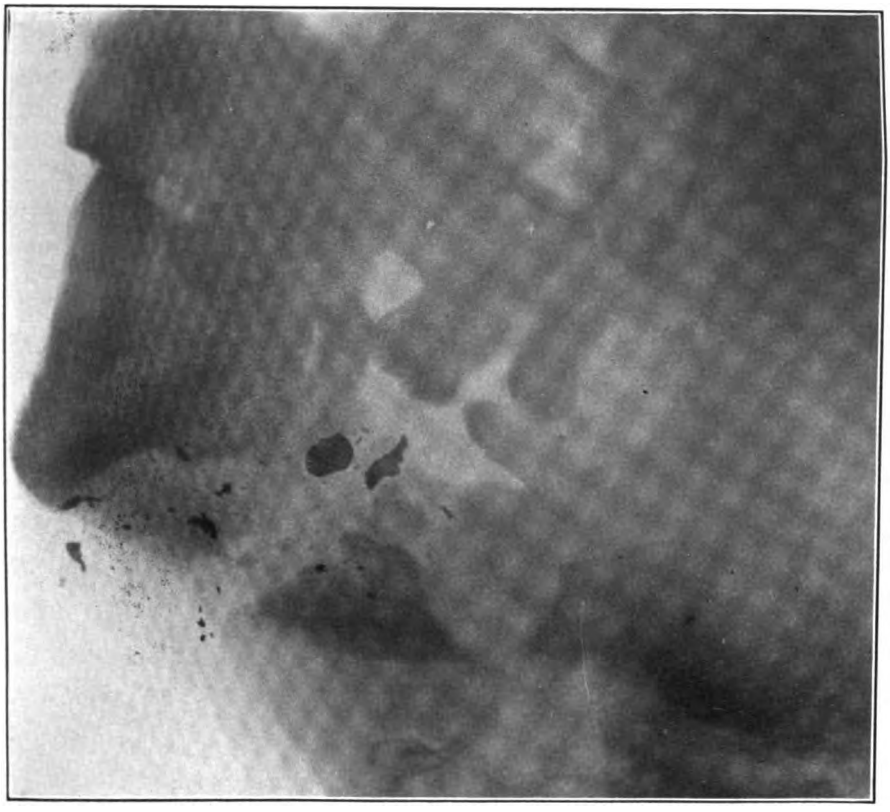


Fig. 12.

from the orbital cavity, through the spheno-maxillary fissure, and the articulation of the malar bone with the superior maxillary bone was separated. By grasping the body of the superior maxillary bone with a pair of large bone forceps, the entire superior maxillary bone was broken away, carrying with it, of course, the floor of the orbit, maxillary sinus, palate, floor of nose and external wall of nasal cavity. Hemorrhage was severe, but quickly stopped and the patient was seen by the author four months after operation and at this time the wound looked very clean indeed, and there had been no recurrence. Patient received post-operative treatment with radium and X-rays and I believe the final result has been good.

Fig. 8 shows a case of dentigerous cyst that I operated upon at Albany last spring.

Patient, young Swede, seventeen years old, came to clinic complaining of swollen face, upper right side and slight pain. Patient said that

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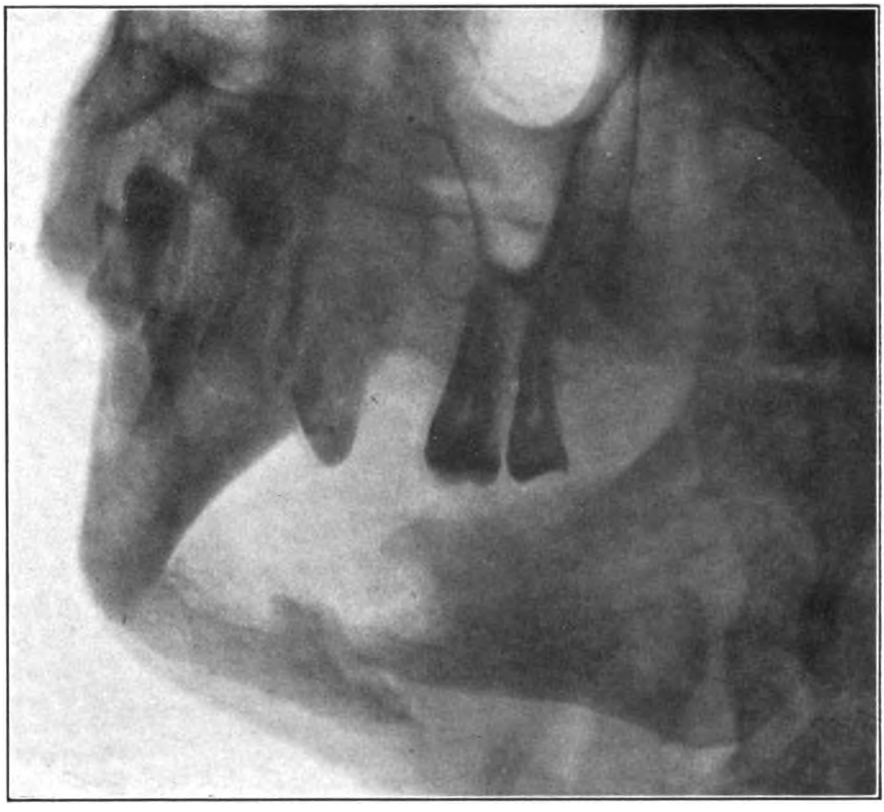


Fig. 13.

his face had been swollen and painful for about eight to ten months. Sometimes swelling of the face would increase and become hard and then would get smaller or go down, and patient thinks that he would at this time notice a discharge in mouth.

Exam. face: swelling of face marked, extending from infra-orbital region to alveolar process, and from ala of nose to zygomatic arch; the entire anterior wall of antrum was ballooned anteriorly about one-half to three-quarters of an inch. Boney wall of antrum greatly thinned out and a distinct egg-shell crackle noted. Somewhat tender, above area somewhat red and slightly warmer than other side.

Mouth: central, lateral, first bicuspid, second bicuspid, first and second molar in position, and in good condition. Third molar erupting, canine missing, and space of one-quarter of an inch between lateral and first bicuspid. Marked swelling over alveolar ridge, extending from canine fossa to second molar region. This swelling was oval in shape

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and was about the size of a pigeon egg. External plate was thin and egg-shell crackle noted as on face. Small sinus noticed just over lateral, and probe could be passed along neck of this tooth into its alveolus, up into large cavity for distance of about one inch. Radiograph showed non-erupted permanent cuspid just over lateral root and above this there was shown another tooth which looked like a supernumerary tooth. Large

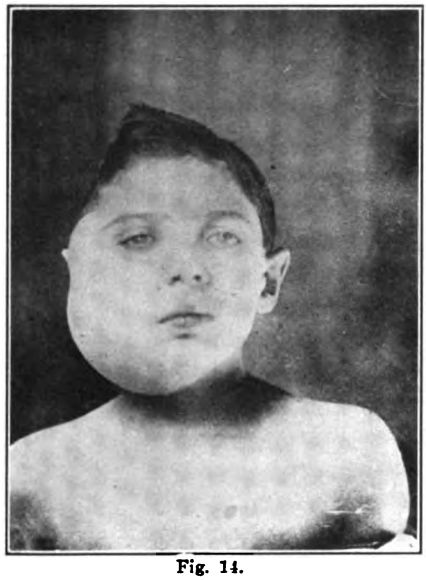


Fig. 14.

cavity shown by radiograph to involve antrum, but unable to tell by film to what extent. Roots of the two bicuspids somewhat absorbed and extending into cyst cavity.

Diagnosis: a true dentigerous cyst containing two teeth. Nose, exam. negative. Ear, exam. negative.

Operation: performed before the members of the New York State Dental Society, Albany, N. Y. Patient given one-sixth gr. morphine by hyperdermic to quiet him, and to relieve from post-operative pain. Cyst area painted with one-half strength tincture iodine. One per cent. novocain injected into swelling of alveolar border, deeply into periosteum and bone. An incision then made along swelling, extending from lateral to second molar. Soft tissue laid back and bone exposed. Anterior wall of antrum found to be very thin; with chisel and mallet broke through thin internal alveolar plate and found large cavity full of thick yellow pus, containing white flakes. Enlarged opening quickly, and entire wall

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of antrum found to be thin, soft and necrotic in places. With Rongeur forceps removed large area of diseased anterior wall and made opening into antrum that would allow passage of ends of four fingers of hand. Excavated about one and one-half ounces of thick pus, irrigated cavity with warm saline solution, and for first time obtained good view of cavity. Cavity extended from floor of orbit to alveolar ridge, from

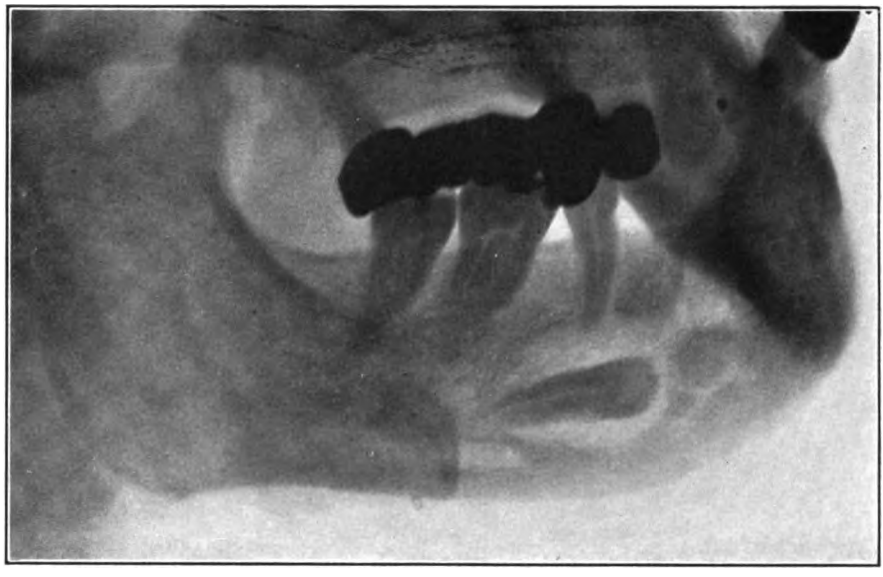


Fig. 15.

second molar tooth to lateral, and upward to floor of nose. Cavity lined with smooth, thin membrane or sac, which was partly removed by operator. Cavity cureted and two teeth, a temporary cuspid and permanent cuspid dislodged from bony wall. Rough edges of thin bone surrounding opening into cavity smoothed off, and cavity packed with bismuth paste and gauze. This cyst cavity was found not to connect directly with nose. The membrane lining bony cavity seemed to wall off nose at middle meatus, the natural communication of nose and antrum. A puncture through nose into cavity was made to establish better drainage.

Treatment: cavity has been packed with bismuth gauze and irrigated with warm saline solution about three times a week for last three months. Opening has closed in greatly, but cyst cavity about same size. Tissues are clean and healthy. Prognosis: opening in cyst cavity and antrum will continue to fill in, but will never completely close. No

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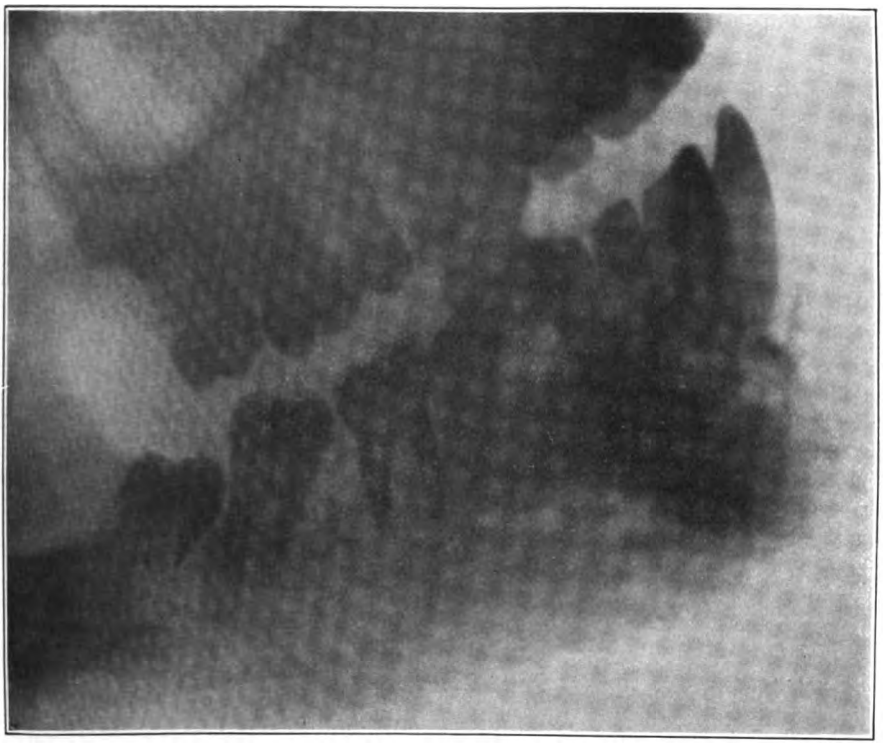


Fig. 16.

danger of recurrence, as lining membrane of cyst has been removed and cause of irritation, the teeth has been done away with.

Fig. 9 shows epithelioma of face which was extremely malignant. Woman fifty-five years old had little "pimple," she said, on face about eight months before this picture was taken. She picked it and then a sloughing sore developed that refused to heal. She went to a hospital where she was treated with radium and X-rays, and says she was burned there and the sore became worse. I do not believe she received a burn at the hospital as it was one of the largest and finest hospitals in New York City. This treatment did not, however, benefit her, in fact, nothing that we could do for the poor woman did help her condition. She became discouraged, as well she might be, and did not return, but I believe, died a few months after I saw her, that is within one year after the first appearance of growth.

Fig. 10 shows a true dentigerous cyst in a child's jaw of six years of age. The swelling was about the size of a small hen's egg, extending from the second molar region to the cuspid. The permanent second

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molar has not yet erupted, the first molar is in place, the second temporary molar is in place, the first temporary molar and also cuspid. The permanent cuspid, first bicuspid and second bicuspid are erupting in normal position under the temporary teeth. All of these teeth were in a cyst cavity, lined by quite a thick membrane filled with a straw-colored fluid. The first and second temporary molars were removed and the

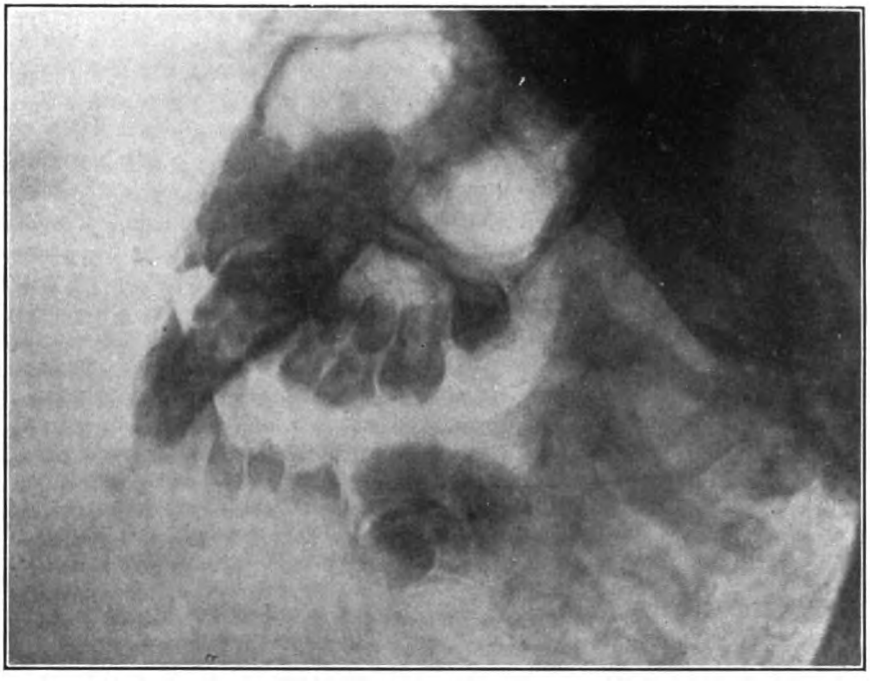


Fig. 17.

first permanent molar. The cyst cavity was thoroughly opened and the sac removed with a pair of thumb forceps. The bony walls were carefully curetted and packed with gauze incorporated with bismuth paste. The cavity was irrigated and packed every other day, and in about six weeks or two months it had almost entirely filled in with granulating tissue.

Fig. 11 shows large piece of necrotic bone due to abscess of a crowned tooth. The tooth was improperly treated and then capped. It remained quiet for some months when finally it became somewhat tender and slightly loosened. The patient did not have it treated and about three weeks later abscess formed which was lanced. Suppurating sinus formed and persisted for about six or eight months after abscess had

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become chronic. Patient presented at clinic with tooth attached to the large piece of necrotic bone that was held in by soft tissue only. The tissues were incised and sequestrum easily removed. Cavity irrigated with weak iodine and glycerine daily, and packed with bismuth paste gauze. Gradually filled in in about three months.

Fig. 12 shows radiograph of gun-shot case. Patient, young Italian, thirty-five years old, shot in the first molar region, lower jaw. The

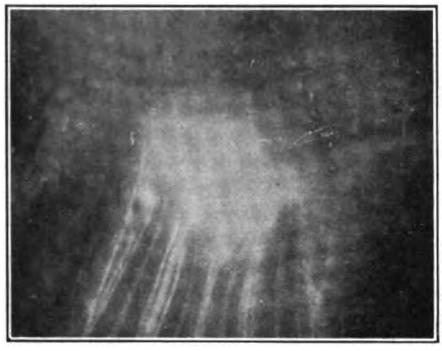


Fig. 18.

bullet split up into several pieces after it had badly splintered and fractured the jaw. The wound was infected and did not cicatrize rapidly. Several sinuses formed later, pus discharged, and spiculæ of bone urse removed off and on for a long time. We wired patient's lower jaw to upper by means of Angle's wires attached to the teeth and obtained a good union and a good result after all the pieces of necrotic bone had been removed, and sinuses had gradually closed in. This took about two months.

Fig. 13 shows a rather rare surgical condition; a pathological or spontaneous fracture of the lower jaw. Patient, man of about forty-five years old. He had a wretched, foul, neglected mouth. He gave a history of having had many abscessed teeth on the lower jaw, right side, and told us that he thought he had lost quite a lot of jaw bone from time to time, due to abscessed condition. He had several large suppurating sinuses in mouth and upon probing these, necrotic bone could be felt. He had had these sinuses and abscesses treated off and on for months at different clinics, and they had not troubled him much up to about two days before he came to us, when he bit on a hard crust of bread. He said that he felt a sort of snapping and slight pain, and then could not use his jaw again. The bone had been so greatly weakened by infection and necrosis that there was not more than one-sixteenth of

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an inch of healthy bone remaining at the point of fracture. We were going to splint this patient's lower jaw to the upper by means of Angle's wires, but he did not return for treatment. He was very alcoholic, and "liquid food" in form of whiskey seemed to agree with him better than solid food.



Fig. 19.

Fig. 14 shows an extensive round cell sarcoma which started as an epulis in a boy about eight years old. When I first saw this boy he had a small epulis about the size of a hazel nut, which seemed attached to the first molar, lower jaw. I removed tooth and growth quite thoroughly, I thought. The boy did not return to the clinic for about three months, and then presented with a growth that seemed to involve the entire half of the jaw and face. The child was admitted at once to the hospital, where the author was at that time house surgeon. Pathological report showed growth to be small round cell sarcoma. It involved the lower jaw, part of upper jaw, and zygomatic arch. It was decided that it would be impossible to help the little fellow by an operation, and so we treated him with Coley's toxin for about two months. The growth soon became broken down and sloughing under the injections of Coley's serum, but did not improve in any degree and the poor little chap died a horrible death after about four months of suffering.

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Fig. 15 shows an impacted first bicuspid in man's jaw, age thirty-five years. This was really a true dentigerous cyst with a sac which was filled with fluid and pus. It was an infected cyst, as there was a sinus leading from the cavity through the bone to the gum and into the mouth. The cyst was open, the tooth and sac removed, the cavity curetted,



Fig. 20.

irrigated, packed with bismuth gauze and allowed to fill in with granulations.

Fig. 16 shows an extensive area of necrosis involving the entire body of one-half of mandible of a young boy seventeen years old. The patient was a fine, husky-looking lad, and the history showed that he had a pain in the first molar of this side of jaw. His dentist filled tooth and then face began to swell. He took filling out and treated tooth, but could not abort abscess, which finally pointed and opened through alveolus in region of molar. His face still remained swollen, and dentist then treated second molar which soon developed an abscess. Swelling of face increased and patient became very sick, high fever, chills, etc. He went to bed and physician was called in who opened abscess on outside of face along lower border of jaw. Abscesses would subside for a while and then new ones would develop and they would have to be opened. This continued for about two months before I saw patient. When he presented at my office he had four or five sinuses leading to dead bone

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inside of the mouth, two sinuses outside of face and several large scars where the doctor had opened abscesses as they developed from time to time. The radiograph shows the entire one-half of the mandible honeycombed, by pus cavities and necrotic bone. The boy is being treated by his own physician in Jersey, and I have not received word lately as to his condition. He will probably lose all the teeth on the affected side from time to time.

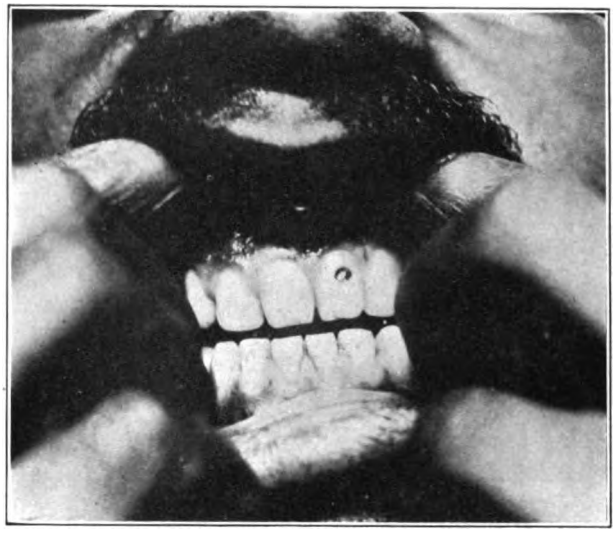


Fig. 21.

Fig. 17 shows radiograph of a true odontoma in a child of seven years. There were no teeth erupted upon the side of the mandible where the growth was situated. History showed that the child has never had any temporary molars on this side, but had had a swelling in molar region for about three years. This tumor did not pain him or trouble him in any way. Radiograph showed that there was a permanent cuspid, permanent first and second bicuspid developing normally and would probably erupt on schedule time. In the molar region the first molar nearly developed, but was fused to a large tumor mass as dense as the tooth itself. This tumor was covered over by a very thin growth of bone covered by periosteum and gum. An incision was made over growth and the entire hard tumor was shelled out. It was hard, being covered by enamel on the outside. It was cut into sections by a pathologist with great difficulty, and was found to be made up of enamel, dentine, and cementum. The first molar was fused to it. The tumor

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contained the elements that were to be used in the development of the second and third molars, but for some reason their development was diverted into this wild, shapeless mass. The cavity was curetted, packed with bismuth gauze and allowed to granulate, which it did very quickly. This, of course, was a benign odontoma.

Fig. 18 shows a rather extensive alveolar abscess, lower jaw, incisor region, resulting from one of the incisor teeth becoming devitalized. Patient, a young man about eighteen years old, came to me with sinus



Fig. 22.

of chin, discharging pus. History: about six or eight months previously he had a slight toothache, left central incisor, which lasted a few days and then chin began to swell and abscess formed. He went to a physician, who incised his chin outside and obtained about a drachm of pus. Abscess then subsided and wound cicatrized rapidly, only to form again in about three months. Patient went to physician again, who told him the jaw bone was affected and that it ought to be scraped. The doctor opened up his chin pretty thoroughly, judging from the old scar, and curetted. No radiograph had been taken, the teeth had not been investigated at all, and, of course, the operation was a failure. This poor boy was cut five times on the outside of his chin, and the sinus was still

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discharging merrily when I saw him. Radiograph showed that the four incisors were "dead teeth" and that their apices extended into an abscess cavity. The teeth had never been filled and, of course, the roots had never been treated. What caused the dead teeth and abscess I don't know, except that perhaps the vitality of the teeth was lowered, and they gradually died after a severe blow the patient had received about one year before his trouble commenced. This treatment comprised having all four root canals carefully treated and filled and then the thorough amputation of all four roots up to their diseased bony attach-



Fig. 24.

ment, the curetage of the sinus and abscess cavity in the bone. Daily irrigation and packing of cavity followed, and sinus and cavity cicatrized completely in the course of a few weeks.

Fig. 19 shows an entire ramus of child's jaw, age six years, that I removed after a long infection from an alveolar abscess of first permanent molar. History: child was poorly nourished, little Italian, very much under size and sickly, came to clinic with acute abscess of six-year molar, lower left side. Tooth had been decayed for months, but had pained child only a few days. Tooth was very loose and painful to percussion. Entire left side of face swollen, the swelling extending from mental foramen to angle of jaw and pointing somewhat downward into submaxillary region. The mouth was in a filthy condition, all the teeth in different stages of caries, the tongue coated. There was a large swelling along the alveolar border from region of first bicuspid to second molar. There was marked fluctuation upon palpation of this swelling. The six-year molar was extracted the day the child presented at the clinic, and the abscess thoroughly incised and drained. A large quantity of pus was evacuated, drain inserted in wound, and it was kept open for

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weeks. In fact, the wound did not heal very much, and several sinuses formed leading to necrotic bone. We saw the child every couple of days, and at each visit irrigated the sinuses with mild antiseptic wash, and probed and waited; several times we removed small pieces of dead bone. After about six months of irrigation of sinus, the tissues around the sinuses became quite inflamed and more pus seemed to discharge from them. With a pair of thumb forceps I could feel a large loose piece of bone held in only by soft tissues. With a knife this sequestrum was quickly freed, and it proved to be the entire ramus, as shown above. The periosteum surrounding this nectrotic bone was left behind, and was

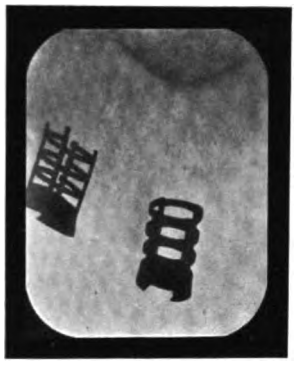


Fig. 24.



Fig. 25.

not injured, and new bone will, in time, be formed. Wound was packed with bismuth paste and gauze and wound began to cicatrize rapidly. Radiographs were taken about a month later, but were not good, as child moved. We lost track of the child shortly after this, but I think the child will have an entire new ramus form in time. There was very little deformity caused by the loss of the ramus.

Fig. 20 shows a photograph of a colored man, age twenty-three years, who came to the clinic with a complete facial paralysis, left side. History showed that one week before coming to us a dentist extracted an upper first molar that was paining him. Shortly after the extraction he noticed that he could not use the muscles on that side of his face, that his face looked thinner and flatter on that side, and, of course, blamed the dentist for this condition. We realized at once, that a possible injury of the fifth nerve in the extraction, could not cause a paralysis of facial nerve. When I saw him he could not use the muscles on affected side at all. The lower eye-lid drooped, and the conjunctiva was greatly inflamed as he could not close his eye to keep the dust out. We

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could not obtain any history of the patient being exposed to severe cold, or anything that might account for the paralysis of the seventh nerve. I called in Dr. Stein, of the New York College of Dentistry, to see him, and he immediately became interested in the shape of the patient's upper central incisors (Fig. 21) and said, "I think he has heriditary syphilis, those centrals are typical Hutchinson teeth." We immediately obtained a Wasserman test, which was strongly positive. We also obtained a positive Wasserman from his brother's blood. We concluded at once,



Fig. 26.

that the patient was suffering from a gumma of the brain that was pressing on the seventh nerve, as it entered the stylo-mastoid foramen. This pressure caused congestion and paralysis of the nerve. We gave him two doses of salvarsan in rapid succession and then started deep inter-muscular injections of mercury. His condition cleared up entirely in about ten days.

Fig. 22 shows photograph of woman forty-five years old, suffering from sarcoma of upper jaw and face. History: She had a tumor of lower jaw about four years before coming to us. She was operated upon in Russia at that time, and the entire lower jaw on the affected side was removed. This case was inoperable and we lost track of the patient a few months after the picture was taken.

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Fig. 23 shows a child six days old with a cleft of the hard and soft palate, and two erupted incisor teeth, lower. The cusps of the erupting temporary first molars, upper jaw, projected through the gum tissue, and erupted in a short time. The incisor teeth had to be extracted as the child hurt the mother's breast in nursing by biting the nipple. The



Fig. 27.

child was a very poor specimen, greatly under weight and size, and had great difficulty in feeding. She died in a few weeks before she could be brought into good condition for operation of the cleft.

Fig. 24 shows two Greenfield platinum roots inserted by the author, in an upper edentulous jaw. The thickest and heaviest-looking root had been in the mouth about four months when this picture was taken. The other root had been in about three weeks. There was no infection around either root and both were quite firm.

Fig. 25 shows a piece of necrotic bone removed from a patient's jaw where a Greenfield platinum root had been inserted about six weeks before. The entire "core" and quite a large piece of the surrounding bone came away, due to the infection which followed shortly after the insertion of the root. The wound quickly filled in with granulations after removing this piece of necrotic bone.

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Fig. 26 shows a young woman twenty-eight years old, with a true ranula or cyst of the floor of the mouth. This cyst was probably caused by the occlusion of the ducts of the sub-lingual gland. The history showed that this swelling had been gradually becoming larger for several months, and at the time when the pictures were taken it had been troubling her for about eight months. There was a swelling in the floor of the mouth about the size of a hen's egg. This swelling was extremely soft and fluctuating, and extended across the floor of the mouth from the second bicuspid region, right side, to the same region on opposite side. It was distinctly elastic like most cysts. It was not painful, but troubled her a good deal in swallowing and talking, as it forced her tongue upward and backward into her pharynx. Upon aspirating this cyst about one and one-half ounces of thick glary fluid was drawn off. In a few weeks the fluid accumulated again, and the swelling became about the same size. The author then operated upon this tumor, making an incision antero-posteriorly, about one inch and a half long. The mucous membrane was carefully laid back and a thin wall cyst was partially dissected out before rupturing it. When the cyst ruptured a large amount of thick fluid was evacuated. The thin membrane of the cyst was carefully dissected out, and the operator was successful in removing about two-thirds of the entire sac. This membrane was very thin and it was extremely difficult to dissect, as it tore upon the slightest pressure. The wound was irrigated, packed with gauze daily, and allowed to fill in with granulations. Radiograph showed no obstruction in the ducts of the sublingual gland, and I believe that there was some catarrhal conditions that occluded this lumen and caused the daming back of the saliva and the formation of the ranula. No ducts in the floor of the mouth could be palpated. The patient was seen by the writer a year later and at that time was perfectly well and there had been no recurrence.

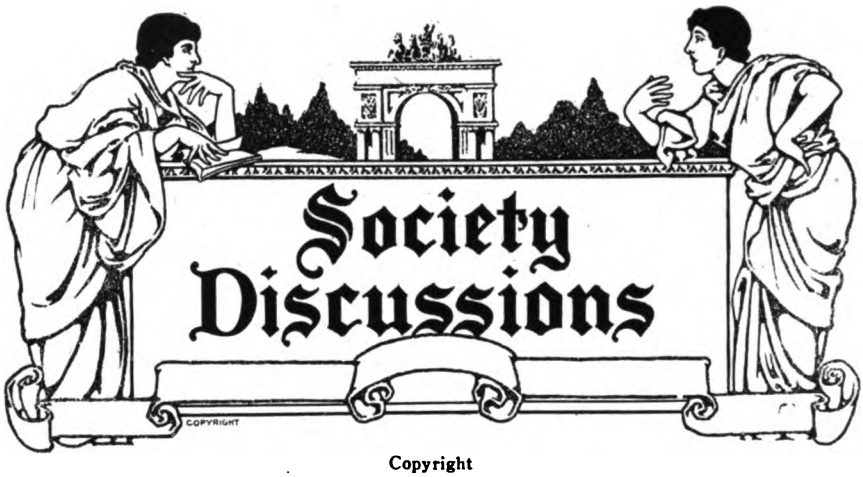
Fig. 27 shows neck of a man of thirty years of age with a thyroglossal cyst. He had had this fistula in his neck for many years. Sometimes it would close and remain so for four or five years, and then it would open again and discharge a thin serum. He said that he always had a sort of swelling at this region which his mother noticed shortly after birth. It had not troubled him for about five years until a few weeks before he came to us, when it began to discharge. Upon probing, a fistulous tract was found which extended upward and to the left about one inch and a half, and almost entered the floor of the mouth. The tract was about one-half inch wide and was lined with epithelium. The orifice of the tract was slightly inflamed and a dark red in color. It became slightly tender when the fistula closed and the secretions accumulated. The tract was injected with diluted peroxide, containing a color-

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ing material, methyline blue, and under novocain the fistulous tract was carefully dissected out. By means of the injection the tract was stained before the operation, and in this manner it was easy for the operator to excise the entire tract, and to remove all the lining epithelium. The wound was then cauterized with carbolic and allowed to fill in with granulations. A permanent cure was obtained. These cysts are congenital, but may not present any symptoms until puberty or even later in life. The presence of these cysts or tracts are due to the failure of the thyro-glossal tract to be converted into a fibrous cord, portions of it remain in the form of isolated vesicles lined with columnar or cubical epithelium, and occasionally undergo abnormal development, forming tumors or cysts in the base of the tongue or upper part of the neck.



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New Jersey State Dental Society.

Discussion of Dr. Smith's Paper.

(*Continued from January number*)

Dr. Jas. B. Davidson, Newark, N. J.

I agree with Dr. Smith that the administration of $N_2O\&O$, in view of its rapid therapeutic action and its asphyxial disadvantage, is a work of specialization and should be recognized as such, thus eliminating the improper use of the same by inexperienced nurses, internes, and anesthetists who have not resolved the theories of administering this combination of gases to absolute practice, and exercising a control on its proportionate mortality in the hands of the unskilled. Dentistry, like surgery, can progress just in keeping with the amount of shock, fear and pain that it is possible to offset.

If legislation and faulty apparatus stood between practitioners of this age and successful dental procedures free from pain, as is the case in some of our neighboring countries, we could not expect America to stand foremost in dentistry. It behooves us to act, as suggested by the speaker, through mediums which will make possible efficient and scientific dentistry.

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The tardy adoption of this medium by the surgical and dental professions has no doubt been due to the past lack of knowledge of administrative principles coupled with imperfect apparatus. Then, again, we have too few mediums from which knowledge may be gained concerning the true technique of work of this particular kind, due to lack of clinical advantages, and last, but not least, the lack of sufficient knowledge of the physiological effects of the gases on the human organs and brain, which together with difficulty in administration lead to its relative high mortality in the hands of the unskilled.

In the dental application of suggestive therapeutics and positive suggestion, the value of positive, well directed, concise and convincing statements have long since been conceded by our profession.

Very few of Dr. Smith's remarks on this subject are debatable, but I would further suggest that by the adoption of the following I think one is more liable to induce confidence and hope than by the methods suggested in the paper, viz.:

1st. The value of the general stage of preparation, which may infer attention to diet, intestinal conditions and the use of preanalgesic sedatives and preanesthetic narcotics.

2d. History of the patient as obtained by questioning, with special reference to kidney, circulatory and respiratory lesions by inquiring whether or not he has been ever afflicted with headaches, shortness of breath, swelling of feet or ankles, sudden blindness, vomiting and, in certain cases, direct reference to blood pressure.

If we adopt the use of anesthetics and analgesics in our daily routine work, we should at least be capable of recognizing the gross circulatory and respiratory lesions—hence the value of clinical experience to the dentist using anesthetics.

3d. Examination of the patient's physical condition with special attention to organs concerned. The value of this is first, to orient ourselves and, secondly, to impress thoroughness and command of situation to the patient.

4th. We should vouch for the patient's physical condition and give him definite assurance relative to his welfare, as it engenders confidence in keeping with our information as deduced from physical examinations.

5th. Very little positive suggestion is necessary after following out the above.

6th. Complete knowledge of technique is necessary in order to warrant our representations and descriptions of the merits of this anesthetic and the principles of operative procedure.

7th. Careful attention to after treatment—which involves in most cases merely rest.

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I would like to emphasize the point that we all are capable of realizing that psychic force is less applicaple to the phlegmatic types and has greater effect on the nervous types—there its specific value is inestimable.

I want to agree with Dr. Smith in his view of the physiological effect of $N_2O\&O$ as an anesthetic. I believe our greatest success lies in the use of pure gases and it behooves every dentist to definitely look up the reports of the American Medical Association and resolve his conclusions in purchasing the gases to those recommended by said organization, which gases are absolutely pure and free from CO_2 and free nitrogen elements together with the higher oxides of nitrogen—because. with pure gases we are more capable of controlling the asphyxial phenomena.

As Dr. Smith has already stated the conclusions and opinions of this anesthetic by authorities (such as referred to in his paper which definitely state the special value of same in surgery), his review of the subject should certainly stimulate a more general adoption of this anesthetic, especially by the dental profession, and in view of the fact that most of our operative procedures are of short duration and are conducive to severe shock and pain, there is no doubt but that our duty lies in more careful consideration of its many virtues.

There are five cardinal principles upon which the technique of administration is dependent, as Dr. Smith definitely stated. It is the lack of recognition of these important qualities, which causes the failures of many dentists and anesthetists, especially when the mechanical design of the apparatus purchased is not capable of carrying out the necessary functions.

Great interference with surgical procedures is no doubt experienced by those unfamiliar with the definite symptoms of CO_2 and N_2O asphyxiation, and to this end experience is the only guide; consequently, special attention and study is advised in regard to the same. I believe that cyanosis is the controlling symptom in the recognition of these two conditions.

It has been my custom to meet this condition in a slightly different manner from that which the speaker advises—I supply nitro-oxid followed with oxygen to prevent recovery from the anesthetic instead of oxygen followed by nitro-oxid.

The adoption of these principles is the result of the experimental research work by our most prominent authorities, and we should not overlook their extreme importance—I refer first to the value of pre-anesthetic narcotics.

2d. To the use of pure oxygen, realizing that 80 to 95 per cent.

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purity is superior to 20 per cent., with the remaining percentage adulterated, as is the case with air; also consider the better condition of our patients after the use of pure oxygen.

3d. Even flow of gases.

4th. With warm gases we have safety, increased value to life, more quiet and profound anesthesia, and more rapid absorption—being careful at the same time not to raise the body temperature.

5th. Rebreathing promotes economy in the use of these gases, with special reference to the value of CO_2 generated by the adoption of this medium and fewer bad results following its use.

6th. Positive pressure promotes greater absorption and makes possible intrathorocic surgery, more profound narcosis and more even anesthesia.

Science has proven the value of these mediums, consequently the limitations of this anesthetic are dependent upon the ability of the average anesthetist to master the above-named principles, recognizing that with the very young, asphyxiation is to be avoided, and that they rapidly come from under its influence and that epileptiform tricking is at all times possible; and likewise—with the very old, we have to recognize that senile charges tend in many instances to bring asphyxial phenomenal difficulties.

I will not take time to discuss further, or to take exception to any of the virtues of this anesthetic as mentioned by the speaker, but in regard to its disadvantages, I believe they are nine out of ten times due to apparatus, which has not been manufactured as a complete full proof mechanism from the standpoint of meeting the requirements when symptoms of the patients indicate changes in our technique.

Analgesia.

In regard to analgesia. We should realize that $N_2O\&O$ plus air when used for analgesic purposes only promotes a disseverance of the cerebellum or sensory portion of the brain from the cerebrum or motor portion thereof or segmental anesthesia. I believe that the delivery of gases under measurable proportions and measurable pressures is the keynote of success, especially in the hands of the inexperienced in regard to the use of these gases for analgesic purposes, because it is conceded that inequalities in the delivery of our gases will, without a doubt, promote inequalities in our analgesic state, consequently, without them we expose ourselves to three conditions, viz.:

1st. Hilarity—due to too much oxygen.

2d. Unconsciousness—due to excess of nitro-oxid.

3d. Approaching the excitement state by inaccurate combinations.

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Under this heading, with special reference to the classification of patients according to Dr. Smith, the truest value of measurable pressures is determined when we meet the particularly susceptible patient; especially when in the formation of our preparations it is possible to deliver a specific number of gallons to the case per hour, under measurable proportions.

If the afore-mentioned principles are incorporated in a modern dental apparatus our operating cost per case is, no doubt, well within the reach of all practitioners, because it completely relieves the inequalities of pressure and consequently promotes operating economy. You can, therefore, see by the foregoing that it is imperative that we avoid the use of simple apparatus.

In conclusion, in regard to shock as divided by Dr. Smith into physical and psychical; those of us who are not using analgesia and anesthesia of the type under consideration, do not realize the amount of shock we are responsible for, even if physical pain is not produced. The dread of being hurt is more wearing on the nervous system of the nervous type than actual physical pain; consequently, admitting the value of all local anesthetics, we cannot avoid physical and psychical pain other than by the use of the general anesthetic as a medium, and that best adapted is undoubtedly $N_2O\&O$.

Against the development and use of these methods of greater safety and efficiency in operative dental surgery, there may be urged the objections that these methods involve a higher training and increased labor on the part of nurses and the operator; that certain new apparatus is required and that the office must meet the increased cost; these easily surmountable objections must be balanced against the disappearance for all time of the dissatisfied patient, the freedom from post-operative shock and the preservation of life itself.

Dr. J. D. Thomas, Philadelphia.

Mr. President, I desire to confine myself to the time allotted to each speaker. I had not received any notice that I was to take part in the discussion of this subject, and did not know that I was to do so until I arrived here at eight o'clock this evening, and, consequently, I have not had an opportunity to prepare myself to speak on the subject as its importance would probably warrant.

It appeals to my mind that it is timely just now to issue a word of caution on the subject of the administering of nitrous oxid for prolonged operations. I will refer to personal experience, and I do not mention this fact for the purpose of self-laudation, but the records of my office stand to-day at two hundred and eighty-eight thousand people. I do

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not wish anybody to think that in that great number of operations there have not been dangerous cases, nor would I wish to convey that impression. On the contrary, from my experience I am free to say that nitrous oxid, instead of its being the safest of all anesthetics, is possibly the most dangerous of all anesthetics.

Dr. Smith.

I would like to ask Dr. Thomas, does he refer to nitrous oxid with or without oxygen as dangerous?

Dr. Thomas: Dangers of Nitrous Oxid.

I refer to nitrous oxid, pure and simple, for the reason that with any agent that is going to produce unconsciousness in the biggest man or woman inside of sixty seconds we will all have to admit that you are approaching the point of dissolution at a mighty rapid rate, and the mixture of air or oxygen is the antidote. While nitrous oxid has the reputation of being absolutely safe, this condition exists. While it was used in the dental profession alone for the extraction of teeth, its safety depended upon the fact that the appearances of danger were so great that even the veriest novice, from fright, would immediately cease giving gas and turn his attention to the resuscitation of his patient. It is a known fact that the greatest danger that we experience in giving nitrous oxid comes from its want of oxidation, as is exhibited in deep cyanosis, the suspension of breathing or the constriction of the glottis, but in the most dangerous cases one breath of air entering into the lungs, voluntarily or involuntarily, is sufficient to start the patient immediately on the road to recovery. That is why there have been so few adverse cases in the administering of nitrous oxid gas. We recognize that nitrous oxid gas is an absolutely inert element, its oxygen does not liberate itself at the temperature of the human body and consequently it goes in and comes out nitrous oxygen, and it carries with it this dual condition.

Asphyxia with Nitrous Oxid.

Nitrous oxid is as pure an anesthetic as any of the anesthetics now known, but it carries with it this state of asphyxia as well as its anesthesia, and under these conditions the exhibition of cynanosis or the want of oxidation constitutes the dangerous element in its administration.

It was at an operation at the Pennsylvania Hospital, in Philadelphia, for an amputation of the thigh, that Dr. Thomas G. Morton asked me if I would administer nitrous oxid gas for the operation, because it was a case in which ether was strongly contraindicated. It was at that operation where I realized that the dual effects of nitrous oxid was strongly apparent. I put the man under the influence of the gas and alternated a breath of air with a breath of the gas, and a breath of air with a breath

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of gas (repeating), and in that way kept him under the influence of thorough surgical anesthesia for twelve minutes during the amputation of the leg, and the man recovered shortly afterwards and within a month was at Dr. Morton's office on a pair of crutches. That clearly proved to me that the dangerous effect of the administration of nitrous oxid was the want of oxidation.

Before that time, scientists had discussed what effects really were produced by nitrous oxid, and there were many that claimed that it was absolute asphyxia instead of anesthesia. Dr. Horatio C. Wood was the last of the scientists of Philadelphia to abandon the opinion that nitrous oxid is simply a cyanosis of asphyxiating agent. I succeeded after this case at the Pennsylvania Hospital in convincing Dr. Horatio C. Wood that nitrous oxid is a pure anesthetic, and would produce profound anesthesia without its accompanying asphyxia if admitted so as to oxygenize the blood. It was from that point that the fact was established that the asphyxia could be overcome by the admission of atmospheric air in proper proportions, which later has culminated in the mixture of the gas and oxygen.

I never administer gas under a hood. I wish to keep the lips in full view, because there the influence of the agent upon the blood will appear more quickly than at any other part of the body visible during its administration. There are many persons who will asphyxiate more rapidly than they will anesthetize. These dangers do appear, and I am always dangers do appear, and I am always particular in my lectures at the University of Pennsylvania to tell the students that they never will become proficient as experts in administering nitrous oxid until they have had occasion to throw one or more patients out of the chair on the floor and work with them until resuscitation becomes apparent. Then they will begin to recognize what they have to contend with by the symptoms of approaching dangers. I would say that there have been fifty or possibly a hundred cases in my experience where I have had to throw the patients on the floor and apply all resources for resuscitation, and, fortunately, we accomplished the purpose.

Possible Idiosyncrasy Against Gas.

Do not forget the question of idiosyncracy. I have known of one case where a dentist in preparing a cavity in a central incisor for filling wiped out the cavity with chloroform for rapid evaporation in order to dry the cavity as quickly as possible. While it was simply on a little point of cotton no larger than a pea, while wiping out the cavity the patient collapsed under the influence of the chloroform. This was simply a case of idiosyncracy, and so it is with nitrous oxid. There are patients that are just as easily affected by the

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administration of nitrous oxid. I have had numbers of cases in which within a moment's time, at the second breath, patients have gone unconscious, which we ascribe to idiosyncracy. These are cases that you must necessarily watch very closely, because it would never do to keep a patient long under nitrous oxid who would be affected so quickly. It is not an agent that a man of inexperience or a novice should ever take the responsibility of using in any way without a thorough knowledge of the attending dangers. As a word of caution I want to emphasize all that Dr. Smith has said upon this point, that under no circumstances should an interne or a nurse of a hospital or any inexperienced attendant ever be permitted to assume the responsibility of administering nitrous oxide oxygen, because it requires a person of experience and an expert to recognize the dangers as they approach under the influence of nitrous oxide, operating as quickly as it does. The operator must be prepared to act with equal rapidity in the operation of resuscitation. He must be prepared and perfectly familiar with every phase, so as to recognize the dangers that are approaching and apply remedies. Mr. President, I think I have probably consumed the time allotted to me and will add nothing further. I have attepted merely to sound a word of caution, in which I have said that nitrous oxid is not entirely free from danger to the patient in its administration.

(The remarks of Dr. Thomas were received with a continued outburst of approval and applause, which increased in volume, with cries from all over the room, which was crowded to the doors by dentists from all over the United States, "Go on, "Go on," "Go on.")

President Thompson. As it seems to be the unanimous desire of everyone present that Dr. Thomas shall continue, I will ask him to do so.

Dr. Thomas: Contra-Indication Against Gas. Mr. President, in continuation of what I have said, resuming where I left off, the contra-indications against the administration of nitrous oxid oxygen are matters of grave importance. There are certain conditions under which gas should not, under any circumstances, be administered. I will give an illustration: A gentleman came to my office one afternoon, accompanied by his wife and sister. He was a stout man, and his condition was such that I at once diagnosed the evident presence of fatty degeneration of the heart. His lips were as white as his cheeks; he was short of breath. He wanted a tooth removed. The moment I looked at him I called his wife to one side and I said: "Mr. X—— is not in condition to take an anesthetic to-day, or to have this done. I wish you would take him home and call in your family physician; he is not well. After his physician has examined

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him and he has secured his advice, if he then wants me to take out this tooth for him I will come up to his house to do it, but I wish his family physician to be present."

Physiological Effects of Nitrous Oxid.

The next day I received word that the gentleman had died at 10 o'clock that morning. That furnishes food for thought, and it shows the necessity of being able to distinguish among your patrons who should and who should not be subjected to the administration of nitrous oxid. Dr. Smith, in speaking of the effects of gas—and I do not mean this in any way to be a criticism of what he has said in his paper—but his understanding of the matter is a little different from mine. Dr. Smith has spoken upon the subject of nitrous oxid anesthesia as if it were produced entirely from the effect of the anesthetic upon the brain cells. That is not my understanding of the physiological effects. As I understand it, the gas is taken up from the lung cells and transferred into the circulation and carried to the remote portions of the body. The anesthesia so produced, in addition to its effect upon the brain cells, begins in its effect with the fine filaments of nerves in the extremities, and as the blood courses through, laden with the anesthetic, the peripherals first become affected, and it approaches further and further to the larger nerves, and if it be carried far enough it would reach the great trunk of the medula and the spinal chord. I compare the effects of anesthetics to some conditions of intoxication by alcohol, only anesthesia is brought about by inhalation, while intoxication is brought about by alimentation, but physiologically the patient is in exactly the same condition to a like extent. A drunken man may be conscious enough to find his way home, yet he may fall down and receive an injury and never know that he has been hurt until he becomes normal. That is because the extremities of the nerves are paralyzed to the extent of not being susceptible to pain. That is the condition in anesthesia. The brain becomes paralyzed, but the nerve extremities of the whole body are likewise paralyzed, and are incapable of receiving impressions of pain. That is the basis of the subject of analgesia: if a patient be partly under the influence of an anesthetic, the peripherals are benumbed, and he may be conscious enough to be able to see a knife drawn across his hand and yet feel no pain from the cut. That is a form of analgesia.

On this question of asphyxia and the dangers approaching from it, they come about, not by the contact of the nerve trunks or the nerve trunk in contact with the anesthetic, but from the moment you apply nitrous oxid to the respiratory organs you cut off a supply of oxygen, and the moment you cut that off there is a demonstration of asphyxia and contortions and contractions of the muscles, and I have even seen

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them come to absolute convulsions under the influence of narcosis simply from the want of oxidation. As soon as you supply nitrous oxid, which is an inert gas, you cut off the atmospheric air, the important element upon which all animal life depends for its sustenance, and it is this want of oxygen which produces the dangerous, disagreeable looking exhibitions. It is the want of oxidation upon the vaso motor nerves that produce all of these evidently dangerous conditions, and which will produce or cause the suspension of breathing and the constriction of the glottis and all those conditions which accompany the administration of nitrous oxid where atmospheric air oxygen are not admitted. (Long continued applause.)

President Thompson. I will ask Dr. Smith to make the closing remarks on his paper, if he desires.

Dr. Smith. Mr. President, it has given me a great deal of pleasure to be called upon to read a paper of such vital importance to the members of the dental profession. I wish to thank you for your kindness, and especially do I wish to thank these able discussers who have made addresses and to thank them for their complimentary remarks. It gives me a great deal of pleasure to note what a wonderful stride this anesthestic has made during the past two years. Dr. Horace Wells gave us this anesthetic in 1844. He demonstrated to us the anesthetic properties of it, and you may say that it has lain dormant ever since until about two years ago. We now have specialists in nearly every line of work in the dental profession. We have the orthodontist, the extracting specialist, the porcelain worker, and a number of others, and we now have a later specialist, the analgesiac specialist. A number of cities through the United States are supporting specialists who are devoting their entire time to the practice of analgesia. That specialist conducts this work along the same lines as the extracting specialist. I know of at least a half a dozen who are practicing it now among the dental profession who did not favorably regard this as an anesthetic a year ago. Some looked on it as a fad especially adapted for producing analgesia. I must say that if it is a fad it is a practical fad, and in the hands of one who has spent a little time in becoming proficient in its use it will bring returns to him in addition to rendering dual service and better advantage than by the old methods. I am, naturally, enthusiastic when I get talking on this subject, when I know of the vast amount of work that can be done with that anesthetic without pain to the patient. It is a success in the hands of practitioners; we know that. I never saw a patient that is willing to be hurt, and patients will prefer the dentists who can give them proper work and at the same time eliminate pain. The man who

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is using analgesia in his work, and who is proficient in it, and who knows how to handle his patients in a proper manner, is the man who is going to be busy.

I wish to verify Dr. Henahan's statement in regard to the machine. It is more than a machine that is necessary to administer nitrous oxid-oxygen. It is true, we must have a good machine, but the man who depends on the machine to be able to diagnose his case I think will fail.

I wish to state my experience with nitrous oxid-oxygen in various cities of the country which prompted me to start a course of instruction, because I saw that the great need of this work was to show many of the dentists that all that was necessary was not alone a machine. They would get a machine, but they did not get good results, and they became discouraged with it, and the anesthetic appliances went back to the supply house and the machine companies. I think it is only a question of time when nitrous oxid-oxygen, analgesia and anesthesia will be a branch of instruction in the various colleges. There are not very many dental schools in the country to-day that are giving a scientific course in anesthetics. It is a subject that is wrongfully overlooked. We are taught through our three years in college how to prepare cavities and how to put in gold fillings, but how many of us have been taught on the subject of the scientific administration of anesthetics or the physical diagnosis of the patient. I know of only three colleges to-day that have introduced this branch and that are showing students anything in practical analgesia. They added that to the curriculum in the last term of the college course.

Ether Added to Nitrous Oxid.

I have had something like five thousand cases for major surgery, and I am proud of the fact that I have had very gratifying results. Coming back to the ether proposition, in the addition of ether to nitrous oxid a great many look upon that as being dangerous. That is not true. I think it is much safer to administer a small per cent. of ether in connection with this anesthetic than to continue with nitrous oxid-oxygen in trying to produce surgical relaxation which results in extremely high blood pressure.

It was not very long ago that I was called upon to administer to a man eighty-two years of age. The blood pressure was very high at the time. I started to administer nitrous oxid-oxygen, and I found that I could not produce the relaxation desired by the surgeon without administering ether. Dr. Tuttle mentioned a case he had, a patient at the Philadelphia Hospital for forty-five minutes under anesthesia. I was present at this operation, and I think it was one of the most beautiful anesthetizations I ever saw. This was a very prominent physician, and

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he had him under the anesthestic forty-five minutes during an operation for double hernia. There was no ether used in this case, and it was very gratifying to me to see this case handled in such an able manner.

I was very glad to hear Dr. Thomas' discussion, and to have him bring out the point as to whether the nitrous oxid produces an effect upon the brain itself. The best theory we have on this is advanced by Dr. Crile, of Cleveland, to the effect that it is a specific anesthetic action upon the brain itself. When pure nitrous oxid is administered, you are not admitting oxygen, and naturally cyanosis will appear. When you add oxygen to the combination it is entirely different. It is not as scientific to administer nitrous oxid without oxygen, because then you have to count on the patient. You must know the fundamental principles of anesthesia in order to give your patient the benefit of the highest professional skill.

Safety and Dangers.

I don't think there is any anesthetic that is absolutely safe. Any agent that can make an individual unconscious is dangerous, and I would much rather go right out on the street and pick up any individual and have him give me ether than to have the same individual give me nitrous oxid-oxygen. It has been stated here to-night that it is not a safe anesthetic in the hands of a novice, but I say that in the hands of one who has made it a study it is the safest anesthetic we have to-day. This was recognized by the American Medical Association. Dr. Henderson has proven that rebreathing is a superior method.

I wish to correct a statement that came to me this afternoon in regard to one of the cases I had in the clinic this afternoon in the adjourning building. It was reported that the case collapsed. This is not true. The patient was depressed, but was not in a dangerous condition. The pulse was beating regularly and a statement of that kind I certainly wish to correct, because it is not doing me justice to have anything like that circulated. I wish to thank you for your kindness. It is with a great deal of pleasure that I have been with you at this meeting. I have certainly enjoyed myself and I hope that I will be in a position to attend many more meetings of The New Jersey State Dental Society.

Second District Dental Society October Meeting.

A regular meeting of the Second District Dental Society of the State of New York was held on Monday evening, October 13, 1913, at the Kings County Medical Library Building, 1313 Bedford Avenue, Brooklyn, N. Y.

The president, Dr. W. G. Lewis, occupied the chair, and called the meeting to order.

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The secretary read the minutes of the last meeting, which were approved.

Dr. Hyatt. I think it would be more desirable at this time, than at any other time in the history of the society, that a committee on membership be appointed. Through the reorganization plan of the National our profession is entering on a new era, and a person who becomes a member of the district society, becomes at the same time a member of the State and National societies; so it seems to me we should sweep away as much as possible, and as soon as possible, any petty feeling that might have existed in the past, and start to work to bring into our society every reputable practitioner in our district. A plan should be devised whereby all reputable dentists should be tabulated; they should be divided into districts, and the committee should be large enough to visit these men personally, and give them the knowledge that being a member of the district society makes them a member of the State and National societies.

(A membership committee was appointed as suggested.)

Dr. Stevenson. The Mouth Hygiene Committee has been asked to furnish articles for the columns of the daily prints, on the subject of mouth hygiene. The papers have applied to us, as representing the society, and if we do not furnish them with these articles, information will be obtained from other sources that would perhaps displease us. We have refrained from supplying any contributions of this kind because we thought some members might not approve of it; but the conclusion of the committee, after talking it over, is that we supply the material for these contributions.

I move that the committee be empowered to furnish to the daily prints articles on mouth hygiene for the benefit of the public.

Dr. Shea. In what way are the articles to be presented—as coming from the society, or from individuals? How are they to be signed?

Dr. Stevenson. That is a matter that will depend a great deal on the editor. Most editors would not accept articles unless signed, and we intended to have the articles signed by members of the society. Such articles would have more influence.

Dr. Babcock. The editor would probably want the article signed as an evidence of good faith; but might not require the name to be printed. Why could not the articles appear as authorized by the Second District Dental Society? You could use a signature in that way, and that would do away with the feeling that it is not ethical to place such matter in the public print.

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Dr. Hyatt. I hope the question of ethics will not be brought up in this foolish way at this date. There should be some person willing to stand back of the statements made in such articles, and if the committee can get any man to sign such an article, we should be willing to back it up. At the First District Society meeting recently it was mentioned that there had been an article in the *New York Times* that attacked orthodontia. Dr. Gillett replied to it, being at that time the vice-president of the society, and fearing that some mal-minded man might misconstrue it, he refrained from using his name, and signed "D.D.S." If he had signed it "Gillett," it would have done infinitely more good; signing it "D.D.S." carried no weight to the minds of many who read it.

I hope to live long enough to see the men in our profession sign their names to articles of that kind for the benefit of the public, and I hope every man who writes such articles will sign them, and that this society will stand by him.

Dr. Babcock. My remark was not an evidence of cowardice at all. As far as I am concerned, it makes no difference to me who writes so long as the facts set forth are true and scientific.

(The motion was carried.)

Dr. Hillyer. Dr. Smith, president of the State Society, is with us, but must leave very soon, and I would like to introduce him to the members and have him say a few words to us before we take up the discussion of the paper.

Dr. Smith. Mr. President and gentlemen: Before arriving here, I meant to say to you that all previous meetings of the State Society would seem insignificant in comparison with the one we expect to hold next spring; but I find myself very much handicapped because I am in the presence of several ex-presidents of the State Society, and I do not wish to seem discourteous. However, I will say that if it is possible to have a better meeting than ever before, I am sure every member, including these ex-presidents, will be glad of it. The encouragement I have received in meeting and corresponding with different members from different sections of the State has been very marked, and has been an inspiration. At this time, when the society merges from a membership of about 250 to over 1,300, I think it adds very much to the responsibility of the members and also to the possibilities of the society.

The New York State Dental Society has, since its organization, been very constructive and progressive. About ten years ago, a decided

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step was taken in advance, I think, when instead of taking whole sessions, or parts of sessions, with business matters, all business was delegated to an executive council, thus giving up the entire time of the meeting to scientific papers and discussions. Then, merging the membership into a larger one, which, I think, was first recommended by your Dr. Hillyer, was a great advance, and I think there is opportunity for still greater work.

If it were not for the lateness of the hour, I should like to outline some of the plans for the future, but I will not to-night.

There seems to be an opportunity this year for doing more work than in the past through the Hygiene Committee, especially because Dr. White has recently been made a member of the State Board of Health to represent the profession, and he has had the promise of an expenditure sufficient to procure a lantern with slides for each of the nine districts. These can be used in the districts for lecture work. I do not know just what the situation would be in the First and Second Districts. In the up-State districts, comprising many small towns, and even country school houses, it is proposed that an acetelyne gas lantern be provided, so that these lectures can be given. This will mean a slight expenditure of money probably in outlying districts. Whether that will apply to Brooklyn and New York, I am not sure; but my purpose in bringing it up to-night is this—you might think best to authorize your local committee to make some necessary expenditures. Some of the other districts have made such provision—I visited the Ninth District on Friday evening, and they took action to that effect. I do not wish to forestall the work of the chairman of the Hygiene Committee, but I know that is one of the things he has in mind.

I am very glad to be with you to-night, and I hope to see everyone of you in Albany next May.

Dr. Hillyer. I would also like to introduce Dr. W. A. White, of the State Board of Health.

Dr. White. Mr. President and gentlemen: There are specialists in every profession. We have them in our own profession, and some think I have digressed from the general practice of dentistry and made a hobby of mouth hygiene. If I have, I am glad of it, because I think the time has arrived when no feature of dentistry is of such importance as this, or is attracting such attention, not only in the dental profession, but in the medical profession throughout the United States. The subject is now becoming a household word.

It is with much pleasure that I announce that after having pursued

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the work with your associates, Dr. Hyatt and Dr. Wheeler, and Dr. Belcher, of Buffalo, the cause progressed so much that the Civil Service Commission thought it of sufficient importance to make it a special department.

I do not believe that there is a feature connected with the dental profession that is of so much importance as mouth hygiene. It is not necessary for you to be a lecturer; you can be a teacher of mouth hygiene every day of your life at your chair, especially if you know as well as I, that phophylaxis is an important feature of our work.

Last year it was my privilege to visit sixty-three cities and towns in your State. I delivered seventy-three lectures, and spoke to a great number of school children. I also delivered lectures to mothers' clubs, nurses' associations and other organizations. This year we are making an effort to increase the work to such an extent that we will double the number of children to whom we will lecture.

Next Monday morning, I expect to commence the work in twenty-six parochial schools.

The call for the lectures outside of the First and Second Districts is so great, that it is impossible to meet the demand, and I am quite positive that there will have to be further appointments made. The work is taken up readily; the instruction is given by the aid of lantern slides, and the children grasp it as easily as any subject taught in school.

Walking down the street in Saratoga last June, following the lecture given there, there was a little urchin who, as I passed him, stopped me and said, "Do you see what I have?" It was a toothbrush and a package of tooth paste. "I am going to clean my teeth; I am not going to have any bugs in my mouth!" Judging by the result from that little boy, whom you would not think would even pay attention to what had been told him, I felt well repaid.

Another time I met a man who said, "Doctor, did you lecture in Albany a year ago?" I said, "Yes." "Well, I bought a toothbrush, and I cleaned my teeth, and now look at them."

I will not tell you the amount of work we undertake to do, but in order that you may know the value of mouth hygiene, I want to quote the words of three of the most eminent men in the medical profession.

Dr. Mayo, who is a great surgeon, and lives in Rochester, Minn., at a banquet tendered to Dr. Brophy recently, made this statement: "Preventive medicine lies in the hands of the dental profession."

At the International Dental Congress, Dr. Knopp, of New York, who is recognized as a great specialist in the treatment of tuberculosis, said: "I defy the most skilful physician to either help or cure a tubercular patient who has decayed teeth in his mouth."

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Dr. Jacobi, who I suppose is known to all of you, and who stands high in the medical profession, gave this opinion: "If more attention were paid to the care of the mouth and teeth, there would be less sickness among the children and less sickness among the adults."

Dr. Dunning then read the paper of the evening, which was illustrated with lantern slides.

Discussion of Dr. Dunning's Paper.

Dr. Clinton B. Parker. The first thing I should criticise at all, is in the essayist's opening remarks—about the physician and his method of operation with his forceps. I think the essayist was very mild in what he says. From several cases I have seen, I should have used some language I did not learn in Sunday-school.

He also speaks of the dentist. I think as a rule the dentists are more to blame than the physicians in the cases he has cited; in their lack of attention to these ulcerated teeth and these fistulous openings which they treat, or which they think they are treating. The method of procedure and practice which Dr. Dunning has shown you, I believe is the only right kind of treatment. It has been my procedure for several years in operating, to follow, as I believe he does, the surgical treatment—not the medicinal treatment that the average dentist uses.

I think the society is very fortunate in having seen these pictures, and in knowing that we have a man who is able to do that sort of work. More of us can do it, if we will. I remember particularly his speaking about the dressing of bismuth paste and gauze. It is one of the greatest things we can use. Iodoform I have no use for, but the bismuth with gauze you can place where you want, and it will stay there. That has been my customs for several years in operations of that character, and with the most satisfactory results. It will apply also to pyorrhea cases. You will be surprised, where you have those deep pockets, if you will pack them with gauze and bismuth paste.

Dr. Shea. Of course, discussing a paper does not mean flattering the man who presents it. When you see a number of X-ray pictures, you can be mistaken sometimes. I have been deceived by a number of them. I have been taking them for five years, and got to the place where I let someone else take care of the work, and the man has become expert, or is so acknowledged. I can show you a case which looks like a positive fracture —there is not a man in the room who would not swear it is a fracture, but when we cut down to the bone, we could not find it. There have been a number of cases that have deceived me and the radiologist. The great point is to be able to make a diagnosis. I think anyone of us

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after we made the diagnosis could do the work. Diagnosis, of course, does not mean that a favorable prognosis will follow in every case.

Dr. Dunning presented a fractured jaw wired and behind some of the teeth were two roots that had not been removed. I do not believe the doctor left those there knowingly.

Dr. Hirsch. In reference to the root canal filling, the doctor spoke of using asbestos. How does he know it reaches the apex, and what method does he use to fill the canals.

Dr. Dunning. In those abscessed conditions where the roots are amputated, I think it is a good thing to go through the apex and fill through to the infected area a couple of days before the operation; this should be done by a good, competent dentist. Open up the canals absolutely, and go right into the bone, and flush it out with a powerful antiseptic, and then pack it with a permanent dressing of asbestos and cement, and you will have it absolutely isolated from the field of infection. Then go through the external plate, and you will only have to think of the necrotic area as you are treating it.

Dr. Ottolengui. Why is cement and asbestos better than gutta-percha?

Dr. Dunning. I do not do any root canal filling myself, and I do not say it is better, but any permanent filling that goes to the apex of the tooth will serve.

Dr. Ottolengui. What is the object of the asbestos? I never heard of it before for root filling.

Dr. Dunning. It is a thin fiber that you can carry to the end of the root; but I suppose any permanent filling would answer as well.

Dr. Hirsch. I have used gutta-percha for a number of years, and the patients come back with perfect results—no trouble whatsoever.

Dr. Dunning. Any good, thorough method of absolutely sealing the root is all I ask for.

Dr. Babcock. I never had any experience with asbestos, but if you take a piece of charcoal, and put it under the microscope, you will find it is rough and jagged, and people who have used it for cleaning their teeth, have had pyorrhea develop. If you use asbestos, I do not think you will have that co-aptation with the canal walls that you get with gutta-percha.

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Dr. Dunning. I agree with Dr. Shea that a radiograph can be "faked," but I know these have not, because they have been taken by a man whom you all know—Dr. McKee.

After a radiograph is taken, I do not know how you can cut down and not find a fracture, if the radiograph shows it is there.

I would not make a diagnosis of a suppurative condition purely by a radiograph, and any man who would is a poor surgeon. Just because a person has a cloudy picture on one side, it would be wrong to operate without any further justification, if there is no pain or other symptom.

Dr. Shea. I do not want Dr. Dunning to think that I wanted to cast doubt on his pictures, but it is possible that an osteitis, totally different in two different cases, will look almost alike to us unless we are familiar with the cases. Dr. Dunning misunderstood me in reference to the radiograph, that seemed to show a fracture. It looked like absolute fracture in a particular position. The radiologist diagnosed it as such, and the other doctors admitted it. My assistant went in, and could not get any signs of a fracture at all. I thought it was strange, and after consulting with the other doctors, I cut down to see if there was a fracture, and there was not. I have the plate, and it is a freak plate.

Dr. Dunning. What was the reason for cutting down?

Dr. Shea. To make sure there was not a fracture.

Dr. Dunning. Was there any deformity or mal-occlusion?

Dr. Shea. Yes; the man had pain on motion. He could not open his mouth without pain. There was no inflammation, and I thought there was trouble in the articulation at the joint, but the picture came back, and after everybody decided it was a fracture, we found it was not.

Dr. Dunning. Could it not have been an old united fracture?

Dr. Shea. I think that would show on the picture. Of course, it depends on the length of time. There was no sign of inflammation.

Dr. Hyatt moved a very hearty vote of thanks to the essayist, which was unanimously carried.

Adjournment.

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The Golden Anniversary of the Illinois State Dental Society.

The Illinois State Dental Society will celebrate its fiftieth anniversary in Chicago, March 23-26 inclusive. It is prophesied that this will be the largest dental meeting ever held; that it will be the best; that there will be a greater number of clinics than ever before; that the clinics will be presented in a manner unique in the history of clinics; that the orations, essays, discussions, and finally the banquet, will be of the highest possible quality.

It is probable that all these anticipations will be realized. The Illinois State Society never does anything half-heartedly. The Chicago Dental Society, when it was known as the Odontographic, conducted the greatest dental meeting ever held by a local society. The attendance, over twenty-five hundred, has never been equalled on any similar occasion. What, then, are we to expect when the State and city are cooperating in this great undertaking? What else but a great achievement?

The literary sessions will include a symposium on the "Illinois State Dental Society; Its History, Achievements, and Present Standing." We are promised an "Oration on Operative Dentistry" and an "Oration on Prosthetic Dentistry," with a special discussion on "Modern Crown and Bridgework."

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International Day.

The plan for clinics at this great meeting is the most remarkable and gigantic undertaking of the kind ever conceived. The clinic will cover three days. March 23d will be known as "International Day." Clinicians from various States, from the Dominion of Canada, and from foreign countries, will be grouped under banners indicating the localities to which they belong and each will demonstrate the best that his State or country may have to offer. These men will be selected after communications with and recommendation by the officers of local and State societies, and undoubtedly will be the ablest men of their sections of the world.

Illinois Day.

On the second day of this clinical congress the clinics will be given by members of the Illinois State Dental Society. It is stated that "two hundred men will demonstrate the best that Illinois can produce, and in a way that will be unique in the history of dental clinics." The writer has been privately informed of the plan by which these Illinois Day clinics will be presented, but prefers not to anticipate the committee in charge, by divulging this at present. Suffice it to say that no such method of giving clinics was ever before conceived, and that the marvelous feature of the scheme provides that every man who so desires may see every clinic presented, in every detail, and in perfect comfort. The clinics are to be classified and divided into fourteen sections, viz.: gold foil, gold inlay, amalgam, cements and enamels, porcelain inlays and jacket crowns, dentures, full and partial, removable bridges, fixed bridges, individual crowns, therapeutics, orthodontia, surgery, analgesia and anesthesia, public service. These sections will be in separate rooms, each accommodating comfortably two hundred or more persons. Each clinical section will include from fifteen to eighten clinicians, with a chairman who will give a brief lecture, fully explaining the features of the work in progress.

Chicago Day.

The third day of the clinics will be known as Chicago Day. On this day will occur the fiftieth anniversary of the Chicago Dental Society. On this day the clinics will be given solely by Chicago men in their own private offices. The day will be divided into definite periods so that a visitor

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may select the various clinics that he may desire to attend, and may see them all by going from office to office, according to announced schedules. The clinicians will be at their best, working in a familiar environment with all their accustomed conveniences at hand. The visitors also will undoubtedly enjoy calling on these men in their own homes, and discussing with them their individual notions on practice, and the conduct of a practice.

Banquet. A great banquet will be held at the Hotel La Salle in the evening, and will undoubtedly be an historic occasion, especially as ladies will be in attendance. Each guest will receive a souvenir Historical Booklet, dealing with the origin, progress, achievements and contributions to the advancement of dentistry made by members of the Illinois Society.

Exhibits. The entire eighteenth floor of the La Salle will be utilized by manifacturers in what promises to be the greatest display of dental appliances ever gathered together. One afternoon will be devoted to demonstrations in this exhibit.

As we go to press, we learn with regret of the demise of Dr. J. N. Crouse, one of the foremost figures in dentistry for the last quarter of a century. A more detailed account is not possible in this issue.

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DR. J. H. CALLAHAN, of Cincinnati, read a paper this winter before the First District Dental Society of New York. I don't know why I said Callahan, of Cincinnati, except, perhaps, that I thought I ought to compliment Cincinnati; because it is not necessary to identify Callahan by mentioning the village where he works. Everybody that knows anybody knows Callahan. If I were writing in Europe, I would call him "Callahan of the United States," just so that Europe would not get any credit.

DR. GILLET, the president, introduced him as "Sulphuric Acid Callahan," but I guess that hereafter we will remember him more on account of his recommendation of "Rosin" for filling root canals. But stop a minute. There I am misrepresenting Callahan right at the start. He particularly explained that he does not use the rosin to fill the root canals, but only as an "adjuvant" when filling canals with gutta percha. I like that word "adjuvant" don't you? Really I don't know whether I feel more grateful to Callahan for telling us about his use of rosin, or for introducing me to that word "adjuvant."

AFTER THE MAIN MEETING, a choice crowd of the lesser lights, who are nevertheless noted for their luminous ideas, even though they are tongue-tied in the regular session, flocked over to the Manhattan Grill, and completely surrounded a round table constructed to fit ten. As soon as the lemonades, vichy-and-milk, cold-tea-with-lemon, and roast crackers with cheese had been ordered, about five men started to speak at once, but the Brother who is usually most mute in meeting talked louder and more persistently, and more continuously than the other four, until one by one they gave up the contest, and all the rest of us finally gathered from the fog of words this sentence: "What does that word adjuvant

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mean anyway, and whatever it does mean why does Callahan use it for filling roots?"

RIGHT AWAY eight out of the other nine (present company being, as usual, excepted) began to explain the meaning of "adjuvant;" but little by little our Best Root Canal Fellow, I mean Filler, got the floor and held it against all comers. Said he: "It amused me to hear Gillet call Callahan, 'sulphuric acid' Callahan, because I happen to know that Callahan scarcely ever uses sulphuric acid for cleansing root canals; he uses sodium and potassium, just as all skilful men do. Now in regard to this new proposition of his to fill the canal first with rosin——"

"HE DOES NOT FILL the canals with rosin" interrupted the Mute Man, "he floods the canal with a rosin solution, and he called that an adjuvant. I asked what an adjuvant means, and I thought you were going to tell us; instead of which you begin talking about sulphuric acid. Now if you know what an adjuvant is, please tell us, because if it is a good thing I want to order a gross right away."

THEN REPLIED the Canal Worker, with a smile of tolerance for his interlocutor: "Why everybody knows what adjuvants are and they don't come by the gross either." I presume he really did know, or he would not have said so, but I observed that he did not enlighten the others. It will be noted that about two paragraphs back, it was stated that "present company," meaning, of course, the "present writer," was also mum about explaining the meaning of this word. As they say about Postum, "there was a reason." Never having actually used the word himself he felt that he could scarcely claim to have a speaking acquaintance with it, but he happens to own a perfectly good Standard Dictionary, and he looked up that word "adjuvant" before he went to bed. And therein he found a very excellent definition.

"AN ADJUVANT," says the Standard Dictionary, is, "Any substance designed to assist the principle means." Please read that twice, or as many times as you find necessary to fix it firmly in your mind. It may seem to you, Dear Reader ("pardon the familiarity, but this appellation is permitted to editors by time honored custom"), that I have wasted a great deal of space over this word "adjuvant" and that I ought to get down to the milk in the cocoa-nut. But you are wrong; I have wasted no words, and this "adjuvant" idea is the milk in the cocoa-nut. It is not Callahan's purpose to ask us to fill root canals with rosin, but to use a rosin solution as an adjuvant; as "a substance designed to assist the principle means," the principle means of filling the canal being the old reliable gutta percha cone. Therefore it is not a waste of time to so explain Callahan's newest proposition, that no one will misunderstand it, as was the case with his sulphuric acid method.

WHILE WAITING FOR our milk-toast and apollinaris, it may be as well to really explain Callahan's new canal filling proposition that you may in-

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telligently comprehend the further discussion which occurred Around the Table. Callahan recommends a solution of twelve grains of rosin in three ounces of chloroform to be used as the adjuvant. He says that the best rosin for the purpose is that made for the violinists, and purchasable at leading music stores. The formula makes a thin solution. A thicker solution will not penetrate the tubuli, but this thin solution will do so, when used correctly, at the same time acting as a solvent for the gutta percha cone.

CALLAHAN'S METHOD is to thoroughly cleanse and then thoroughly dry out the canal, flood the same with the rosin solution, and then introduce a gutta percha cone, moving the same in and out with a pumping motion. He says: "The pumping motion forces the rosin into every opening, and at the same time dissolves the periphery or outside of the gutta percha cone, which becomes more attenuated, slips farther and farther towards the apex, surrounding itself with a mixture of gutta percha and rosin, which sticks tightly to the canal walls and makes the gutta percha more stable and proof against the action of body fluids, or substances with which it may come in contact."

CALLAHAN SHOWED numerous actual specimens, as well as beautiful lantern slides of the same, in color, made with the Lumaire Color Process plates, that were most convincing evidence of his statement that the resinous solution penetrates the tubuli. He admixed stains with the chloroform-rosin solution, and sections of the filled teeth showed the stain radiating in all directions into the dentinal tubuli, and of equal importance, penetrating into minute tributaries from the main pulp canal. Indeed, in several cases tiny canals of this character became evident under this process of filling that would scarcely be expected to exist by those who have never made sections of teeth and who, therefore, believe that a root canal is always a single continuous channel, from pulp chamber to foramen.

NOW THAT YOU KNOW what they were discussing we can hark back to the Table Talk. "As I was saying," resumed our Leading Canal Worker, "Callahan's sulphuric acid proposition has never been entirely understood by the majority of dentists. Anyway, the main point, as Callahan truly said, is to first get the canals cleaned out, and whether it is done with sulphuric acid, or with sodium and potassium, it then remains to thoroughly seal the foramen. One reason why I like the sodium and potassium treatment is that it not only enables us to remove the contents of the canal, but at the same time it acts as a germicide and sterilizes the tubuli. After that, if it really be true that the rosin solution hermetically seals the foramen and the tubuli, why then I think Callahan has brought us a good method."

"THAT IS TRUE ENOUGH," said the usually silent gentleman, "but if I understand Callahan's adjuvant solution, it acts as a solvent of the cone, is thin enough to penetrate the tubuli, and by doing so deposits a resin.

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Now as a matter of fact do we not accomplish the same thing when we flood a canal with eucalyptus? That is a gutta percha solvent, and probably holds a resin in suspension also, which may be deposited in the tubuli."

"LET ME CORRECT YOU," interjected the Chemist Person. Eucalyptol is a camphor, not a resin. Camphor is a crystaline substance distilled from the bark of the camphor trees. It is a sedative and antispasmodic, but I cannot see how it would be useful in the tubuli, except, perhaps, that it is not soluble in water. Now, resin is made by distilling with alcohol and then precipitating with water. It is an oxidized terpene. There are three kinds of resins, the true resin, gum resins, and oleo resins. The true resins are hard compact products of oxidation made up chiefly of what are called "resin acids," which admixed with fatty acids, are capable of saponifying with alkalies——"

"WAIT A MOMENT," cried the Old Practitioner, "spare us a chemical lecture. Keep it for your class. I can't see what difference it makes whether you fill the dentinal tubes with a camphor or a resin, since both are insoluble in body fluids. Don't forget that they saved the obelisk in Central Park from destruction by filling the pores of the soft stone with paraffin. And also remember that quite a number are recommending paraffin as a root canal filling. And by the way, let me tell you a story that will be new to you youngsters. Many years ago we had in the Odontological Society a man who would always claim that "five years ago" he had done any new operation that might be described at a meeting." "His descendants are with us yet," said the Irreverent One, "but don't let me interrupt the story." "Well," continued the Ancient of Ancients, "one night a few of us were in the Grill of the old New York Hotel, and we plotted to try a little trick on this Constant Claimant. At the next meeting, one of our number arose and seriously described his success with common tar, as a root canal filling. Immediately arose our versatile member and he spoke his little piece somewhat in this fashion:

"'I AM VERY GLAD that our young friend has reported his experiences with tar, for though I have been using it myself for some six or seven years with marked satisfaction, I have hesitated to report it for fear it might be looked upon as too empirical a practice. And yet, why not use tar? Is it not common custom in the South to use tar on the bottoms of boats to make them water tight, and is it not moisture above all things else that we endeavor to keep out of root canals? My method is to roll the tar into fine cones, which I keep in a cool place, to render them hard, and thus easily forced into the canals. Then with a blast of warm air, the mass is slightly softened, and a second cone is forced into the first, and Gentlemen, it is my belief that not only is the foramen sealed, but the tubuli of the dentine also.'

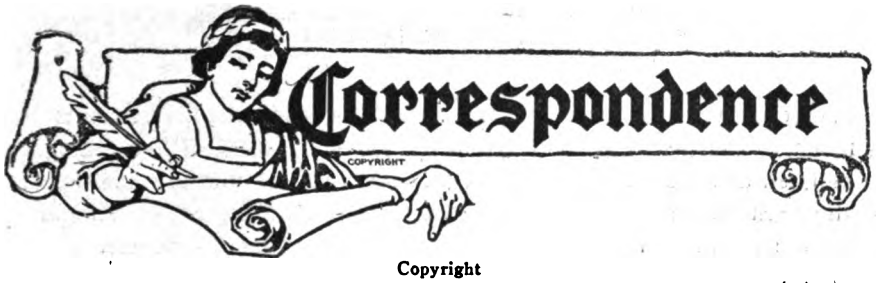
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"THIS WAS TWENTY YEARS AGO," continued the Old Practitioner, "and it was looked upon as a joke at that time, as no one believed that roots had ever been filled with tar, save in the imagination of the speaker. Yet to-night Callahan has described in a serious and scientific manner a very similar procedure, for after all does not tar come within the resin group?"

"THAT DEPENDS," exclaimed the Chemical Expert, "upon whether you are alluding to coal-tar or wood-tar. The former is obtained in the manufacture of coal-gas, and is otherwise known as gas-tar. Wood-tar is made by a distillation of pine or other resinous woods. The conversation has taken a curious turn, and really it might be of advantage to experiment with tar as a root canal filling. Tar is not only a resinous product, but it likewise contains paraffin. Also it yields valuable disinfecting compounds, such as carbolic acid, and cresol. Moveover, it is a reliable preservative agent. Again——"

"NO! NO! NOT AGAIN, nor yet ever," cried the Sleepiest Man; "Somebody pay the check and let us go home. You have all been talking about filling roots as though a root canal could be made about the size of a gas pipe. When I get them that size, I can fill them myself, not only to the end, but often a long way beyond the end. And I can fill them with anything from soft soap to silver wire. But when you meet those nice long fine canals, so fine that it takes about an hour's work to get the finest broach approximately near the apex and only about a tenth of a second to withdraw one half of the broach and leave the other half permanently lodged about a millimeter this side of the foramen, that is the time when I feel like calling in one of you canal experts to teach me how to fill roots. And some night I am going to ask somebody exactly that question, but not to-night. It is too late. Here, Waiter, give me that check. I want to be popular the next time we gather Around the Table because I am going to be fussy and ask questions. Ta! Ta! Boys!"

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Regulation of Teeth by Absent Treatment.

To the Editor of ITEMS OF INTEREST.

DEAR SIR: You should be congratulated upon your editorial, "The Regulation of Teeth by Absent Treatment," in October ITEMS OF INTEREST. The custom of a dental laboratory or supply house selecting orthodontia appliances for a dentist and telling him how to treat a case, is wrong, and should be prohibited by the statutes of the different States, or made impossible through the intellectual and moral advancement of the dental profession. The editor truly points out, "No man, dentist or orthodontist, competent to treat a case, would forward casts to a supply house, permit said supply house to decide upon the style of appliance to be used and then proceed to adjust the appliance and to treat the case under directions furnished with the apparatus," and I might add, no intelligent, conscientious dentist, lacking knowledge and experience in orthodontia, would forward models to a dental laboratory for design and manufacture of the appliances, and then attempt to treat the case, expecting to benefit the patient so that he could conscientiously claim a fee for his services.

In the catalogue from which you quote, Illustration No. 2 bears the legend: "This shows the regulating appliance fitted to the model. It is complete in every detail, guaranteed to accomplish results. All you have to do is to place it in the patient's mouth." One might as well place a rifle in the hands of a blind man telling him that it is "guaranteed to accomplish results"; all you have to do is to pull the trigger. Illustration No. 3 is labeled: "This shows the complete retaining appliance fitted to the model after the treatment for irregularity has been completed." The lingual wire shown in place on this model might retain the expansion, but the spurs from central incisor bands hooked over the lingual wire, as shown in illustration, certainly would not prevent those teeth from returning to their former positions of torso-occlusion. This is clearly a case of "The blind leading the blind."

When models of cases of malocclusion have been brought to your correspondent with a request that he tell the dentist what appliance to use, and how to use it, he has often thought of a remark made by a great teacher of orthodontia, who also is interested in the manufacture

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of regulating appliances. When asked by some of his students how much to charge for orthodontia cases, he said: "I feel like telling you as I tell dentists who bring models to me and ask how to treat the case and then how much they should charge. I tell them, 'You should not receive a fee from the patient for attempting the treatment, but you should pay the patient for the privilege of gaining the experience.'"

A dental laboratory proprietor recently brought to the writer a model of upper teeth. These teeth had evidently been treated by appliances and from instructions furnished by a laboratory or supply house. There was no model of the lower teeth, neither were there models nor one word of description to show the original state of malocclusion. Bands had been made for the upper central incisors and first bicuspids. The impression was taken over these bands and they were in place upon the model. A lateral incisor and cuspid were in torso-occlusion. The dentist wished the laboratory to design the retainer. When the laboratory proprietor asked what the dentist meant and how to design the retainer, the writer could only reply that he always found it necessary to carefully study the models of a case, both upper and lower, made *before* treatment, while making a retainer.

The practice of a dentist sending models to a dental laboratory or supply house for the manufacture or selection of regulating appliances, is tantamount to a general practitioner of medicine, who, desiring to perform a difficult operation unfamiliar to him, sends to an instrument manufacturer for a set of instruments "guaranteed to accomplish results" and accompanied by "specific instructions" for the performance of the operation. Would any of the readers of ITEMS OF INTEREST, if needing their vermiform appendix removed, care to have the operation performed by a general practitioner whose knowledge of the subject is confined to the meager lectures and clinics which he attended while a student, but who upon the purchase of a set of instruments accompanied by "full and complete instructions" essays to do the operation? Is the dentist who attempts to treat a case of malocclusion of the teeth from instructions furnished by a dental laboratory, any less guilty? No, he is committing a crime, and it should be impossible for the practitioner whose love of money is stronger than his sense of duty to his patient, to be misled by the dental laboratory with appliances for sale.

A conscientious professional man's moral and ethical evolution progresses through observation and study, thus acquiring knowledge until a point is reached where he will not attempt operations which he is not prepared to perform well. As editor of the ITEMS OF INTEREST you are helping to "speed the day."

Fraternally,

A. H. KETCHAM.

Denver, Colo., December, 1913.

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National Society Meetings.

National Dental Association, Rochester, N. Y., July 7, 8, 9, 10, 1914.
American Society of Orthodontists, Toronto, Can., July 2, 3, 4, 1914.
Panama-Pacific Dental Congress, San Francisco, Calif., 1915.
Canadian Dental Association, Winnipeg, Manitoba, May 26, 27, 28, 29, 1914.

State Society Meetings.

Arkansas State Dental Society, Little Rock, Ark.
Secretary, Dr. C. L. Hunt, Fort Smith, Ark.

California State Dental Association and Southern California Dental Association, Yosemite Valley, Cal., June 29-30, July 1-2, 1914.
Secretary, Dr. E. E. Evans, Union Savings Bank Bldg., Oakland, Cal.

Colorado State Dental Society, Manitou, Colo., June 18-20, 1914.
Secretary, Dr. E. W. Spencer, 120 Pope Block, Peblo, Colo.

Connecticut State Dental Association, Hartford, Conn., April 21-23, 1914.
Secretary, Dr. Arthur V. Prentis, New London, Conn.

Florida State Dental Society.
Secretary, Dr. Alice P. Butler, Gainesville, Fla.

Georgia State Dental Society, Atlanta, Ga., June 4-6, 1914.
Secretary, Dr. M. M. Forbes, Candler Bldg., Atlanta, Ga.

Illinois State Dental Society, Chicago, Ill., March 23-26, 1914.
Secretary, Dr. Henry L. Whipple, Quincy, Ill.

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INDIANA STATE DENTAL ASSOCIATION, Indianapolis, Ind., May 19-21, 1914.
Secretary, Dr. Otto U. King, Huntington, Ind.

KENTUCKY STATE DENTAL ASSOCIATION, Louisville, Ky., March 9-12, 1914.
Secretary, Dr. Chas. R. Shacklette, Atherton Bldg., Louisville, Ky.

MAINE DENTAL SOCIETY, Augusta, Me., June 25-27, 1914.
Secretary, Dr. I. E. Pendleton, Lewiston, Me.

MARYLAND STATE DENTAL SOCIETY.
Secretary, Dr. F. W. Drew, 701 N. Howard St., Baltimore, Md.

MASSACHUSETTS DENTAL SOCIETY, Boston, Mass., May 7-9, 1914.
Secretary, Dr. A. H. St. C. Chase, Everett, Mass.

MICHIGAN STATE DENTAL SOCIETY, Detroit, Mich., April 9-11, 1914.
Secretary, Dr. F. Ward Howlett, Jackson, Mich.

MINNESOTA STATE DENTAL ASSOCIATION, Duluth, Minn., August 6-8, 1914.
Secretary, Dr. Benjamin Sandy, Syndicate Bldg., Minneapolis, Minn.

MISSOURI STATE DENTAL ASSOCIATION, St. Louis, Mo., April 21-22, 1914.
Secretary, Dr. S. C. A. Rubey, Warrensburg, Mo.

MISSISSIPPI DENTAL ASSOCIATION, Vicksburg, Miss., June 23-25, 1914.
Secretary, Dr. M. B. Varnado, Osyka, Miss.

MONTANA STATE DENTAL SOCIETY, Great Falls, Montana, June, 1914.
Secretary, Dr. F. W. Adams, 14-15 Chicago Block, Billings, Montana.

NEBRASKA STATE DENTAL SOCIETY, Lincoln, Neb., May 19-21, 1914.
Secretary, Dr. H. J. Porter, Cambridge, Neb.

NEW HAMPSHIRE STATE DENTAL SOCIETY, Weirs, N. H., June 17-19, 1914.
Secretary, Dr. Louis I. Moulton, Concord, N. H.

NEW JERSEY STATE DENTAL SOCIETY, Ocean Grove, N. J., July 15-18, 1914.
Secretary, Dr. John C. Forsyth, 430 E. State St., Trenton, N. J.

NEW YORK STATE DENTAL SOCIETY, Albany, N. Y., May 14-16, 1914.
Secretary, Dr. A. P. Burkhart, 52 Genesee St., Auburn, N. Y.

NORTH CAROLINA DENTAL SOCIETY, Hendersonville, N. C., June 24-27, 1914.
Secretary, Dr. J. Martin Fleming, Raleigh, N. C.

OHIO STATE DENTAL SOCIETY, Columbus, O., December 1-3, 1914.
Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

PENNSYLVANIA STATE DENTAL SOCIETY, Phila., Pa., June 30, July 1-2, 1914.
Secretary, Dr. Luther M. Weaver, Phila., Pa.

TENNESSEE STATE DENTAL ASSOCIATION, Chattanooga, Tenn., June 4-6, 1914.
Secretary, Dr. C. O. Rhea, 625½ Church St., Nashville, Tenn.

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TEXAS STATE DENTAL ASSOCIATION, Fort Worth, Texas, April 13-17, 1914.
Secretary, Dr. J. G. Fife, Dallas, Texas.
UTAH STATE DENTAL SOCIETY, Logan, Utah, June 19-20, 1914.
Secretary, Dr. I. P. Stewart, 1st Nat. Bank Bldg., Logan, Utah.
VERMONT STATE DENTAL SOCIETY, Rutland, Vt., May 21-23, 1914.
Secretary, Dr. P. M. Williams, Rutland, Vt.
WEST VIRGINIA STATE DENTAL SOCIETY, Huntington, W. Va., August 12-14, 1914.
Secretary, Dr. A. C. Plant, 802 Schmulbach Bldg., Wheeling, W. Va.
WISCONSIN STATE DENTAL SOCIETY, Fond-du-Lac, Wis., July 14-16, 1914.
Secretary, Dr. O. G. Krause, Wells Bldg., Milwaukee, Wis.

The Sixth International Dental Congress, London, England, August 3-8, 1914.

The Sixth International Dental Congress will be held in London, England, August 3-8, 1914. The committee appointed by the National Dental Association having in charge the affairs of the congress relating to the U. S. A. have selected the following to take part in the congress program:

ADDRESSES

Dr. H. J. Burkhart, Batavia, New York, to deliver the address on behalf of the National Dental Association at the opening session.

Dr. Edward C. Kirk, Philadelphia, Pa. Address before the general session, the afternoon session of the opening day; subject, "The Tendencies in Dental Education."

REPORTERS

SECTION 1—DENTAL ANATOMY, HISTOLOGY AND PHYSIOLOGY

"The Evolution of the Human Dentition,"
Dr. I. N. Broomell, Philadelphia, Pa.
"Calcification".....Dr. A. R. Starr, New York City, N. Y.
"Chemistry and Physiology of Saliva,"
Dr. Edward C. Kirk, Philadelphia, Pa.

SECTION 2—DENTAL PATHOLOGY AND BACTERIOLOGY

"The Etiology of Dental Caries"....Dr. B. Holly Smith, Baltimore, Md.
"The Etiology and Pathology of Pyorrhea Alveolaris,"
Dr. Percy R. Howe, Boston, Mass.

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"Pathological Conditions of the Dental Pulp,"
Dr. R. W. Bunting, Ann Arbor, Mich

"The Pathology of the Antrum"...Dr. Chas. H. Oakman, Detroit, Mich.

SECTION 3—DENTAL SURGERY AND THERAPEUTICS

"Inflammatory Diseases of the Gingival Margin and Periodontal Membrane, Pyorrhea Alveolaris"...Dr. T. Sidney Smith, Palo Alto, Cal.

"Restorations of Lost Portions of Tooth Substance by Inlaying,"
Dr. R. Ottolengui, New York City, N. Y.

"Oral Sepsis in Relation to General Disease,"
Dr. C. N. Johnson, Chicago, Ill.

"The Prevention of Oral Sepsis by Treatment,"
Dr. J. D. Patterson, Kansas City, Mo.

SECTION 4—DENTAL PHYSICS, RADIOGRAPHY AND METALLURGY

"The Uses and Advantages of X-Rays as an Aid to Diagnosis, including the Differentiation of the Radiographic Appearances of Normal and Abnormal Tissue".....Dr. Howard R. Raper, Indianapolis, Ind.

"The Structural and Other Changes Arising in Connection with Metals Used in the Mouth".....Dr. Clarence J. Grieves, Baltimore, Md.

"The Theory and Practice of Pressure Casting,"
Dr. Weston A. Price, Cleveland, Ohio.

SECTION 5—DENTAL PROSTHESIS

"Articulation and Articulators".....Dr. J. H. Prothero, Chicago, Ill.

"Design and Retention of Partial Dentures,"
Dr. H. J. Goslee, Chicago, Ill.

SECTION 7—ORAL SURGERY AND SURGICAL PROSTHESIS

"The Late Results of Cleft Palate Operations,"
Dr. Truman W. Brophy, Chicago, Ill.

"The Treatment of Dental and Dentigerous Cysts,"
Dr. Wm. Carr, New York City, N. Y.

"Surgical Prosthesis of the Jaws".....Dr. M. C. Smith, Lynn, Mass.

SECTION 8—ANESTHESIA. GENERAL AND LOCAL

"Gas and Oxygen, Alone, in Mixture and in Sequence for the Extraction Operation".....Dr. Chas. K. Teter, Cleveland, Ohio.

"Gas and Oxygen Analgesia for Conservative Operations,"
Dr. Thos. B. Hartzell, Minneapolis, Minn.

"Local Anesthesia with Special References to (*a*) Methods, (*b*) Drugs, (*c*) Sphere of Usefulness, (*d*) Contra-indications and Dangers,"
Dr. Eugene R. Warner, Denver, Colo.

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SECTION 9—ORAL HYGIENE, PUBLIC INSTRUCTION AND PUBLIC DENTAL SERVICE

"The Effects of Dental Treatment on National Health and Physique,"
Dr. Herbert L. Wheeler, New York City.

"Prophylaxis at Different Ages"...Dr. A. R. Melendy, Knoxville, Tenn

"Lantern Demonstration of Slides Showing (*a*) Means of Affording Public Instruction in Dental Hygiene, *e. g.*, Lecture Material, Charts, etc., (*b*) Photographs of School Dental Clinics, Institution for Public Dental Service for Adults or other Institutions in which Public Dental Treatment is Being Carried Out,"
Dr. Wm. A. White, Phelps, New York.

SECTION 10—DENTAL EDUCATION

"Methods of Teaching Orthodontics to Dental Students,"
Dr. S. H. Guilford, Philadelphia, Pa.

The following have been selected as Honorary Presidents of the Sections:

Section I. Dental Anatomy, Histology and Physiology,
Dr. Mathew H. Cryer, Philadelphia, Pa.

Section II. Dental Pathology and Bacteriology,
Dr. Thos. B. Hartzell, Minneapolis, Minn.

Section III. Dental Surgery and Therapeutics,
Dr. Edward S. Gaylord, New Haven, Conn.

Section IV. Dental Physics, Radiography and Metallurgy,
Dr. J. P. Buckley, Chicago, Ill.

Section V. Dental Prosthesis.....Dr. D. O. M. LeCron, London, Eng.

Section VI. Orthodontics.....Dr. Roscoe A. Day, San Francisco, Cal.

Section VII. Oral Surgery and Surgical Prosthesis,
Dr. J. D. Patterson, Kansas City, Mo.

Section VIII. Anesthesia—General and Local,
Dr. Thos. P. Hinman, Atlanta, Ga.

Section IX. Oral Hygiene, Public Instruction and Public Dental Services.....Dr. Herbert L. Wheeler, New York City.

Section X. Dental Education..Dr. Henry W. Morgan, Nashville, Tenn.

A list of the essayists and clinicians will be published later.

The committee invite the ethical members of the profession of the U. S. A. to become members of the congress. Membership, which includes admission to the congress sessions and a copy of the proceedings is $7.50 and for members of their families accompanying them $3.75.

Dr. Herbert L. Wheeler, 560 Fifth Avenue, New York City, has been appointed by the committee to arrange for steamship rates, sailing dates, itinerary, etc. Those desiring to attend the congress, sailing with

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the American delegation, immediately following the meeting of the National Dental Association, Rochester, N. Y., July 10, 1914, are requested to correspond with Dr. Wheeler.

BURTON LEE THORPE, Secretary,
3605 Lindell Blvd.,
St. Louis, Mo.

TRUMAN W. BROPHY, Chairman,
WM. CARR,
S. H. GUILFORD,
WALDO E. BOARDMAN,
Committee.

Sixth International Dental Congress at London, August 3-8, 1914

The Committee on Transportation of the National Dental Association have completed arrangements with the International Mercantile Marine Company, comprising the American, Atlantic Transport, Leyland, Red Star, White Star and White Star-Dominion Lines, whose fleet includes such large, splendid and steady steamers as the *Olympic, Oceanic, Adriatic, Baltic, Cedric, Celtic, Lapland, Minnewaska, Minnehaha, Minnetonka, Minneapolis, Laurentic and Megantic,* sailing to and from numerous prominent ports in England and the Continent and application for sailings and rates should be sent in at once.

Special Rates.

Our delegates to the congress will be allowed a reduction of twenty-five per cent. from tariff rates on all steamers of the I. M. M. Co. Lines sailing on and after July 9th from America and to August 20th from Great Britain and Europe with the single exception of the *Olympic* August 19th from Southampton and Cherbourg for New York.

Please note that when the concession referred to would bring the price for passage below the minimum rate of the steamer selected, the lowest rate of that steamer will be charged as follows:

Olympic, $130 to or from Plymouth, Cherbourg and Southampton.
Oceanic, $110 to or from Plymouth, Cherbourg and Southampton.
Adriatic, $110 to or from Queenstown and Liverpool.
Baltic, Cedric and *Celtic,* $100 from Queenstown and Liverpool.
Lapland, $97.50 to or from Dover and Antwerp.
Other Red Star Line steamers, $85 to or from Dover and Antwerp.
Majestic, $95 to or from Plymouth, Cherbourg and Southampton.
Atlantic Transport Line, $85 to or from London.
Laurentic and *Megantic,* $92.50 between Montreal, Quebec and Liverpool.

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Reservations. It is important in order to obtain good accommodation that delegates to the congress should communicate at once regarding reservations, with the International Mercantile Marine Co., 9 Broadway, New York City, stating the dates of their proposed outward and return sailings, also their requirements as to accommodations. Applications will be filled in the order of their receipt. A deposit of twenty-five per cent. of the eastbound passage money is required when the reservation is made, the balance for the round trip being payable at least three weeks prior to the outward sailing.

The committee will also reserve dining saloon seats, steamer chairs and rugs, the deck chairs and rugs renting at $1 each for the voyage. Seats can also be reserved on the trains to London, for which the rates, first-class, are as follows:

Via Southampton	$2.75
" Plymouth	7.50
" Liverpool	7.00
" Dover	4.75

Travelers' Checks. The committee also calls the attention of delegates to the travelers' checks issued by the International Mercantile Marine Company in denominations of $10, $20, $50, $100 and $500, which will be found the safest and most convenient way of carrying funds, as the checks are accepted by hotels, shops, banks, etc., throughout Great Britain and Europe. These are issued for their face value, plus ½ of 1 per cent. commission, and checks not used will be redeemed at face value. It will be to the advantage of the association for its members to use these checks.

White Star Dates. As the White Star sailings available for the congress, from New York, are on July 9th, 16th and 18th, arrangements have been made with the Holland-American Line for those who wish to sail on Tuesday the 14th, to do so, on their steamer New Amsterdam, on which the following rates have been secured.

They will allow a discount of twenty-five per cent. on the tariff rate, for all rooms on Deck A (except the *Chambres de Luxe*) with the understanding that each room be occupied by three passengers.

On Decks B and C they will place all outside and inside rooms we require, at our disposal, at the minimum rate per berth, provided that each room be occupied by three passengers.

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The number of passengers to be carried to be divided in proportion to the available accommodations on Decks A, B and C.

Any communications concerning this boat should be sent to Mr. Nyland, Holland-American Line, 21 State Street, New York City.

HERBERT L. WHEELER, Committee.

560 Fifth Avenue, New York City.

Joint Meeting California State Dental Association and Southern California Dental Association.

The joint meeting of the California State Dental Association and the Southern California Dental Association will be held in the gerat Yosemite Valley of California on June 29-30, July 1-2, 1914.

It is expected that this will be the best and largest meeting held on the Pacific Coast.

Persons who have dental methods or appliances of unusual interest are requested to confer with the undersigned in order that they may be given places on the clinical program.

DR. E. E. EVANS, Secretary,
California State Dental Association.

Union Savings Bank Bldg., Oakland, Cal.

New Jersey State Dental Society.

The forty-fourth annual convention of the New Jersey State Dental Society will be held at the North End Hotel, Ocean Grove, N. J., July 15, 16, 17, 18, 1914.

The hotel is situated on the ocean front, at the foot of Wesley Lake. It is within a few feet of the Asbury Park Casino and within a block of the Asbury Park trolley. The meetings will be held in the hotel, while the entire second floor of the pavilion will be devoted to the clinics and exhibits. This pavilion is over the ocean, with plenty of light and every chance for the cool sea breezes to blow through. A bridge over the board walk connects the hotel and pavilion, so that it makes an ideal arrangement for a convention.

An attractive meeting is being arranged and a cordial invitation to attend is extended to all ethical dentists.

JOHN C. FORSYTH, Secretary.

430 E. State St., Trenton, N. J.

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New York State Dental Society.

The forty-sixth annual meeting of the Dental Society of the State of New York will be held at Albany, N. Y., May 14, 15 and 16, 1914. The literary program will be rendered at the new State Educational Building. The clinics will be given at the Hotel Ten Eyck, and the dental exhibits in the hotel rooms, as was arranged for the 1913 meeting, which proved very satisfactory to the exhibitors.

An exceptionally attractive meeting is being arranged. A cordial invitation is extended to all ethical dentists in New York and sister States.

Exhibitors please address Dr. O. J. Gross, 404 Union St., Schenectady, N. Y., for space.

There will be the usual reduction of R. R. rates on the certificate plan.

A preliminary notice will be issued during the month of March, 1914, and the following month the completed program.

The Executive Council will meet at the Hotel Ten Eyck on Wednesday, May 13th, at 3 P.M.

For further information address,

A. P. BURKHART, Secretary.

52 Genesee St., Auburn, N. Y.

Canadian Dental Association.

The Canadian Dental Association meets for the first time in Winnipeg, Manitoba, May 26 to 29, inclusive, 1914, and a convention of unusual interest and profit is expected.

M. H. GARVIN, Secretary.

314 Somerset Block,
Winnipeg, Manitoba, Canada.

Texas State Dental Association.

The thirty-fourth annual meeting of the Texas State Dental Association will be held at Fort Worth, Texas, April 13, 14, 15, 16 and 17, 1914.

In addition to the regular program, the Oklahoma Post-Graduate plan will be tried at this meeting.

Dr. Geo. H. Wilson, of Cleveland, will present Prosthetics with special reference to anatomical occlusion, and Dr. Frank H. Skinner, of Chicago, Pyorrhea, Prophylaxis and Removable Bridgework, in connection with same.

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For information relative to space for exhibits, or as to clinics, address Dr. W. H. Nugent, Fort Worth, Texas. Any other information will be cheerfully furnished by the secretary.

J. G. FIFE, Secretary-Treasurer, Dallas, Tex.
FRANK FORMAN, President, Waco., Tex.

Washington State Dental Board.

The Washington State Dental Board convenes next May at Seattle for examinations.

PASCAL W. YEARSLEY, D.D.S., President,
208 Paulsen Building, Spokane, Wash.
R. L. MOAK, D.D.S., Secretary-Treasurer,
Montesano, Wash.

Arizona State Dental Society.

At the fifth annual session of the Arizona State Dental Society, held in Phœnix, November 5-7, 1913, the following officers were elected:

President, W. A. Baker, Tucson; Vice-President, J. L. O'Connell, Phœnix; Secretary-Treasurer, H. H. Wilson, Phœnix.

Massachusetts Board of Registration in Dentistry.

A meeting of the Massachusetts Board of Registry in Dentistry will be held in Boston, March 4-5-6, 1914. For applications and further information apply to the Secretary, Dr. G. E. Mitchell, No. 14 Water St., Haverhill, Mass.

Florida State Dental Society.

At the thirteenth annual meeting of the Florida State Dental Society, Atlantic Beach, the officers elected for the ensuing year were as follows: J. W. Darsey, president, Palatka; W. E. Van Brunt, second vice-president, Tallahassee; A. M. Jackson, recording secretary, Lakeland; Alice P. Butler, corresponding secretary, Gainesville; C. L. Nance, treasurer, Tampa.

ALICE P. BUTLER, Corresponding Secretary.

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Fig. 1.

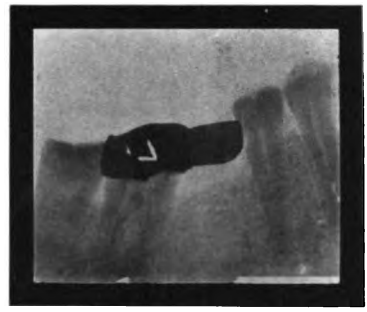


Fig. 2.

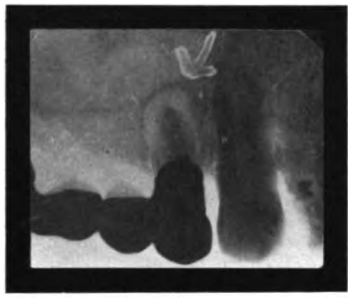


Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.



Fig. 8.

SEPTIC DENTISTRY. *See Editorial.*

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"The Passing of the Gold Foil Filling—A Prophesy."

By C. Edmund Kells, D.D.S., New Orleans.

"To escape criticism in this life one must walk the road of obscurity."—
Herbert Kaufman.

The fact that Drs. Young, Ottolengui and Gillett have filled some twenty pages of the Items of Interest in replying to my criticism (of six and a half pages), and that the subject was apparently of such importance that Dr. Ottolengui devoted one editorial to it, impels me to "close the discussion," as it were, and incidentally correct some errors into which the writers have fallen, for which Dr. Ottolengui has kindly offered me space.

Taking up these replies serially, I will reply first to Dr. Young (October Items of Interest).

Reply to Dr. Young.

Dr. Young has overlooked the fact, as the caption shows, that it was *Dr. Ottolengui's editorial, "The Passing of the Gold Foil Filling—A Prophesy,"* to which I took exception in my original critique, and that the criticism of his (Dr. Young's) paper was merely an incident. Had not the editorial in question appeared, there would have been no

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occasion for my criticism, for certainly his paper would not have attracted any other than ordinary interest.

It is by discussions of this kind that new ideas are originated or brought to light, and thus progress is made by the participants in particular, and the profession in general, but all such discussions to be of real value must be based upon the sincerity of the writers.

Therefore when Dr. Young states, "Thus we learn that Dr. Kells occasionally makes inlays, and that each one fits perfectly," we recognize that the necessary attribute of sincerity is wanting in his reply, and therefore dismiss it without further consideration.

Reply to Dr. Ottolengui.

When I undertook to criticise the editorial in question, I fully realized what I was "up against," for we all know that almost any member of the dental profession would back Dr. Ottolengui to win what would seem the losing side of *any argument* against any other member, with apparently everything in his favor. But in this case his enthusiasm had carried him so wide of the mark—at least that was my idea at the time, and still is—that I concluded to take my chances, and evidently my course was correct, for he now admits that he did not mean exactly what his words distinctly stated, and it may be questioned whether or not the predicted revolution has as yet greatly darkened the horizon. Kindly letters of encouragement, some from strangers from afar, have also been received with pleasure.

It is the discussion of a paper which usually brings out points, which, while perfectly clear to the writer, are sometimes more or less obscure to or misunderstood by the readers, and thus it is that such discussions are so valuable and should be encouraged.

So when Dr. Ottolengui says, "Dr. Kells has seemingly misapprehended some of the views expressed" (by Dr. Young), I now find that he is quite correct. I am free to confess that I did not realize that it was the ragged little sulci that Dr. Young insisted must be reproduced. I thought it was the *occluding planes*, or I would not have tendered my old crowns in evidence.

But all this, as before stated, was merely an incident. *"The Passing of the Gold Foil Filling—A Prophesy,"* was the crux of the contention, so let us to it.

And now comes the defendant into court and admits that he did utter as true, "Time was when the gold used for filling of teeth was known as 'soft' foil," and later on as"non-cohesive gold" (November ITEMS OF INTEREST, page 384). "With the discovery of the cohesive quality of gold a revolution in filling methods was rapidly instituted"

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(page 385). *"Thus cohesive foil will be superseded by the inlay just as it took the place of soft foil."* And now again he returns saying (page 813), "But I did not mean, and never have publicly expressed, the belief that gold foil should or ever will be abandoned."

It is possible, of course, at times to so phrase one's words as to render their real meaning and intent somewhat ambiguous, but where will one find any reader of the ITEMS OF INTEREST who will for a moment consider any ambiguity in the sentence,*"The Passing of the Gold Foil Filling—A Prophesy,"* more especially when a full editorial is occupied in explaining the *reasons for its passing.*

Webster defines Pass (Passing) to mean, "To disappear, to vanish, to die."

"Beauty is a charm, but soon the charm will pass."

The passing of a method, of a procedure, or of an operation, can have but one meaning—it disappears, it vanishes, it dies; it is no longer practiced.

There was a time when it would have been in order to say: "The Passing of Dr. John Allen's beautiful continuous gum work," "The passing of the practice of preparing cavities entirely by hand," and so on, for these methods have practically vanished, as Webster defines the word, and time *may* come when it will apply to the gold foil filling, but that certainly was *not* in May, 1913.

Webster also defines Prophesy as "a declaration of something to come, a prediction." Now take the true meaning of the word *passing* and add it to that of the word *prophesy,* and how can anyone other than Dr. Ottolengui figure it out to mean other than what it does?

However, *if* when Dr. Ottolengui wrote the caption, *"The Passing of the Gold Foil Filling—A Prophesy,"* he did not mean it, and *if* the three pages of the editorial explaining fully why the gold foil filling would be abandoned, and reason for the *"Prophesy"* was not meant, and *if* the predicted revolution, dating from the day of the editorial, was not expected to occur, why then, of course, there is nothing for any of us to take exception to.

Density of Cast Pure Gold.

A minor point inadvertently brought in by me was considered of such importance as to warrant an entire editorial to its discussion, and that was the density of the cast pure gold filling.

It has never been perfectly clear to my mind why the specific gravity of a filling had anything to do with its value *to the patient.*

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Dr. Ottolengui quotes from Dr. Black, giving the readings of seven test fillings, ranging from 17.4 to 19.42. Now it certainly is conceivable that the 17.4 filling might be perfectly adapted to the walls, and quite dense *upon its surface,* and thus be a better filling for the preservation of the tooth than the 19.42, which, while being more densely packed throughout, might be very imperfectly adapted to the walls.

Heat Treatment of Steel.

How little the specific gravity of a metal *may* affect its usefulness is shown by the fact that in the automobile industry certain steels are given the *heat treatment.* "Steel that originally had a useful strength of sixty thousand pounds per square inch, and a toughness of ninety units, after this heat treatment had a useful strength of one hundred and seventy thousand pounds per square inch and a toughness of one hundred units, and during the process *its specific gravity was lessened!*" (Peerless Motor Car Co.)

So really, the specific gravity of a filling, within certain bounds, has nothing whatsoever to do with its value in the preservation of the tooth in which it is placed.

To soften gold to its most extreme point, one would naturally heat it or melt it and allow it to cool. The casting process brings out in the cast filling the extreme degree of malleability, of which pure gold is capable, no matter what may be its specific gravity. Pure gold thus reduced to its most malleable state is therefore not considered by many of the leading operators best suited for the restoration of large occlusal surfaces, be they inlaid fillings, crowns or bridges. These men originally used pure gold for this purpose, but after seeing it fail to stand the stress of use, owing to its extreme malleability, have replaced it with some form of alloyed gold possessing *hardness* to better resist attrition, and *rigidity* to better protect walls of cavities where these attributes seem especially desirable.

The editor is perfectly right when he says (page 887): "Let us not determine this upon the dogmatic allegation of any man." At the same time we must not lose sight of the fact that whatever *appears* to be the result of certain scientific investigations, each individual operator is the best judge of what *nets him* the most success.

Therefore, when many of our best-known and most successful operators with extensive practices, and therefore plenty of opportunity for observation, have discontinued the use of pure gold for the special uses cited, and have replaced it with a less malleable alloy such action must carry considerable weight with the average man.

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Reply to Dr. Gillett Teeth in Old Age.

Dr. Gillett, after taking me to task for what I did *not* say, very courteously asks to be corrected if he did not "fairly interpret" my words. All of his criticism upon this topic—"teeth in old age"—seemed to be based upon his careless reading of what I wrote. I did not say "it is my invariable policy to shorten the cusps of *all* bicuspids." Turn to page 737 and read, "Many a tooth that has been weakened by the loss of its pulp and deep-seated cavities may be saved from splitting by judiciously grinding down its cusps and those of its antagonist where such are *dangerously long.*"



Fig. 1.



Fig. 2.

Now, as not all bicuspids I meet contain these three elements of weakness, that is, dead pulps, deep-seated cavities (such teeth with saddle fillings) and dangerously long cusps, it is readily seen that I do not "destroy the usefulness of all bicuspids I meet," as Dr. Gillett charges.

Moreover, as a matter of fact, I meet very few bicuspids containing these three elements of weakness, so I really shorten the cusps of but few teeth.

Again he should note that I distinctly said I "shortened" (ground down) these cusps, which does not mean that I grind the cusps away to such an extent as to destroy the usefulness of such teeth.

The very day following my reading of Dr. Gillett's paper, my first patient, a big, powerful man, presented with the condition shown in Fig. 1, and the very first thing I did for him, backed by years of experience and careful observation, and *notwithstanding Dr. Gillett's ideas upon the subject,* was to slightly shorten this weak cusp by grinding, the pulp being dead and the fillings large.

Teeth may be different in New Orleans from those in New York, as Dr. Gillett suggests, but physical laws are most certainly not, and it is

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therefore most surprising that he falls into the error that such teeth are split by the "wedge-like action of the filling."

It is not the force of ordinary mastication *on the filling* that splits off these cusps, but it is the force exerted upon an unexpected hard particle—a shot in a piece of game, a pearl or small piece of shell in an oyster, a small fragment of chicken bone—*caught at just the right angle* upon the weakened cusp—which causes the damage.

Within the month I have met with one molar (quite recently inlaid by an expert dentist) and several bicuspids of the character described (containing the three elements of weakness) which lost their lingual walls in this manner. I may be wrong, but I verily believe that had those teeth been judiciously treated with a carborundum stone whose lingual walls would still be present and performing their duty, too. The last bicuspid so presenting had for its mate upon the other side of the jaw a tooth shown in Fig. 2, and I very promptly slightly shortened its lingual cusp, thereby lessening its chances of sharing the fate of its mate, and at the same time probably not destroying its usefulness to the extent of perceptibly affecting the forces!

And as long as my mind operates "within the past decade," which I trust will be *at times* to the end, I will continue this practice, experience having proven its value, knowing full well that I lose thereby the opportunity of extending my practice in the line of crown work greatly to the benefit of my patients.

When I said it is an indisputable fact that in most mouths there is a very decided deviation from the normal, I can assure Dr. Gillett that I really thought I was merely giving expression to a well-known fact, and to have him say that it is merely a "very erroneous personal opinion" is most amazing.

For us to meet (in our office) an adult with a full complement of thirty-two teeth, and all in normal occlusion, is so very unusual that it never occurred to me that it was not the same with other operators, and Dr. Gillett must admit that any deviation from the thirty-two teeth in perfect occlusion, *not to say articulation,* is a deviation from the normal.

I can but consider that Dr. Gillett is very wrong here but I am willing to be convinced of my error, and so if he will let me drop in some morning next October and "show me" normal occlusions in his patients, as they come in one after another during the day, I will readily admit my error.

Object of Dentistry.

It certainly is astonishing how a man can run wild at times when enthused upon a subject.

When I said, "One of the principle objects of dentistry is to save teeth," he should at least have

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given me the credit of taking into consideration the general well being of the patient.

To judiciously grind off a small portion of a single cusp or sometimes both cusps, just enough to lessen the amount of leverage, which might prove fatal, and thus save the tooth, does not in my opinion destroy its usefulness, and by no means renders such a tooth a "helpless paralytic" or "limping cripple," nor endows it with any other imaginary evils. It still remains a good, respectable member of the dental arch, and its owner is not even aware that it has deviated from the normal.

It is evident that, carefully worded as were these sentences, Dr. Gillett must have hastily read them or he could not have reached the conclusions recorded.

Twelve out of the thirty-two teeth have no occlusal surfaces upon which gold inlay enthusiasts can exploit their ability in large occlusal restorations, and thousands of these anterior teeth have been filled by soft gold workers *of the past century*, with fillings which have been invisible to the ordinary observer, tooth substance not having been needlessly sacrificed, and very many of which have stood for from twenty-five to forty years, and some much longer. Can you beat that?

His fanciful vagaries regarding "helpless cripples" and "limping paralytics" were but a waste of words.

Caries After Correction of Mal-occlusion.

I nowhere showed any desire to thrust upon the orthodontic work the onus of the thirteen large inlays; I simply emphasized the fact that correcting the irregularity had failed to prevent them. Of course I must admit the possibility of caries before, during and after the orthodontic period which the first casts may not have shown.

However unfortunate was the original selection of the illustration in question, Dr. Gillett's explanation as to the reasons for these wholesale restorations certainly renders it much more so. The appearance of the finished work is not under consideration. It was the *necessity* for such work that is deplorable, and this becomes much more so after Dr. Gillett's latest explanation of the case.

The models shown in Figs. 24 and 25 certainly are from first-class impressions. Dr. Gillett must give Dr. Young credit for that, and there is not a cavity to be seen. For me to assume they were "free from caries" was certainly excusable, for anyone would naturally have supposed that an orthodontist would have seen to it that any incipient decay would have received such immediate attention that such wholesale devastation of the occlusal enamel surfaces could not become necessary.

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Here, then, is the deplorable feature—unless those sulci and fissures in these thirteen teeth were different from all teeth I have ever seen—there must have been a time when this incipient decay could have been cut out in all their little spiderlike ramifications with a No. 1 or No. 2 bur and these grooves filled with amalgam probably—soft gold possibly—and these occlusal surfaces preserved in this manner for many a year.

Notwithstanding the fact that she was *"always under careful observation,"* the work was not done at the right moment, nor at a time



Fig. 3.

when gold foil would probably have served best, and when *at last* it was undertaken, the restorations as shown were considered necessary by Dr. Gillett. Further comment is unnecessary.

Who has not seen in children *"always under careful observation"* bicuspids and molars just erupting through the gum with their enamel in their sulci not well formed, and these sulci cut out immediately with a No. 2 or No. 1 bur, filled with cement for the time being, and thus prevented from meeting the fate of this unfortunate young girl?

Tiny Inlays.

That it is only at this late day that Dr. Gillett has discovered that the filling of small cavities by the casting process is possible is surely a most astonishing confession, for others have known of it almost since its introduction.

Several years ago, when the art was young, the writer sent the specimen shown in Fig. 3 to Dr. Johnson, with a short sketch of his process for making these tiny inlays. The sketch was published in the *Dental Review,* but not the illustration. All things which are possible are not always practical, and while once in a great while a combination of circumstances renders it advisable to use up an hour or several hours in the making and completion of a tiny inlay, as a rule it is most practical to complete the operation in a few moments by an old-time filling—

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the kind that I have been contending from the first has not yet seen, and probably will not soon see, its "passing."

There is a man by the name of Emerson who is called "The High Priest of Efficiency," and of whom we have all read. I wonder how much *below nothing* he would rate the efficiency of any operator who would require several hours to inlay a few tiny cavities which he could fill with foil in a few minutes—that self-same old foil that is "best adapted to the saving of teeth!"

Conclusions.

From the facts stated it may be concluded that while Dr. Ottolengui does not expect the *"Prophesy of the Passing of the Gold Foil Filling"* to come true, Dr. Gillett sincerely does, as shown by his saying that the operator of the future will inlay any cavity, "for old or young—occlusal and approximal."

Nearly everything that I have learned has been from or through the work of others, and so when upon occasion it falls to my lot to pass some word along, it certainly is a pleasure so to do.

It is therefore with *intense satisfaction,* tinged, however, with *some regret,* that I realize that I have been the accidental means of introducing into Dr. Gillett's practice such a radical change in his method of filling minute cavities—pleased only because he seems so enthused over it, not because I approve of the change, and with some regret because of the belief that the change will not be of benefit to his patients.

The Schoolmaster Abroad.

That many dentists have always run to "fads" is most deplorable. There are many yet living who still suffer from Dr. Arthur's disking process, though that was a short-lived fad of some forty years ago. We have quite recently passed through the copper amalgam and cataphoresis fads. Then came the abuse of porcelain bridges and the craze for porcelain fillings where they were at least indicated. Now come those like Dr. Gillett, to inlay every cavity filled with gold, although many operators have already awakened to the fact that gold inlays are not going to be always satisfactory just because they are gold inlays.

The *common people* are doing a lot of thinking these days, and every dentist who did not see a certain article in the New Orleans papers of January 10, 1914, has missed something.* Already the writer has had several families leave their dentists and come to him with the statement that they were tired of having their *"teeth cut to pieces for gold*

*See copy of newspaper clipping, appended.—Ed.

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inlays which did not stay in." This very day a man—a recent arrival in New Orleans from a large Western city—spoke his mind upon the subject of gold inlays, at the time of making an appointment to have one reset (?)

Let us hope that the operator of the future will be best equipped to treat with judgment each individual tooth as its condition calls for. Gutta-percha and cement, copper amalgam and other alloys, the combination of tin-foil and gold foil, soft and cohesive gold foils, synthetic cements and porcelain, gold inlay in a class by itself—the ability to use each and everyone of these to its best advantage—that is the hope of the people who are in his hands.

Incidentally he should follow Dr. Young's ideas upon the restoration of occlusal surfaces, when that is practical.

It has long been known that New York City boasts of a "leisure class," and some of us have suspected that some of our dental friends might belong to it. Now that Dr. Gillett intends to inlay all cavities where gold is indicated, and Dr. Ottolengui takes out perfectly good amalgam fillings to be replaced by inlays, we may be sure that they at least will not belong to it in the future, whatever they may have done in the past.

[*Clipping from New Orleans Daily Paper.*]

"Let Me See Your Teeth Before You Show Your References."

Said a business man recently to an applicant for employment:

"I won't buy imperfect machinery and I won't hire imperfect workers.

"I learned my lesson last year, and I am still suffering from a $5,000 toothache in my sales-manager's jaw.

"I sent him out after the biggest contract we ever had a chance to bid on. He caught cold in a bad tooth while on the train, and the next morning, when his brain ought to have been leaping like lightning, his jaw was jumping like thunder.

"He couldn't put his mind on my business. He was thinking about oil of cloves instead of lubricating oils; and a second-rate concern, represented by a healthy youngster, walked off with the order."

Many big corporations are adopting the common-sense policy of this man.

No matter how much character and ability an employee may possess, he is unreliable if he isn't in fit condition.

An inefficient body is a distinct handicap nowadays.

The Exposition of Big Ideas

will present a number of important truths to workers in every walk of life, not the least among which will be the relation of health to success.

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It will demonstrate that a sound constitution is a necessary adjunct to progress.

The time is rapidly approaching when merchants and manufacturers will seriously weigh the state of a man's teeth and digestion, as well as his shrewdness and dependability.

The reduction of health to a profit and loss basis is one of the most insistent jobs with which the twentieth century has to deal.

A damaged human is no different from any other piece of damaged machinery. The Exposition of Big Ideas will show the newest ways to prevent and repair damaged health.

When you learn to devote as much attention to your body as a good mechanic pays to his tools, your future is assured.

The physical efficiency exhibit of the Exposition will, in common with its many other departments, attract universal attention and produce signal betterments for New Orleans.

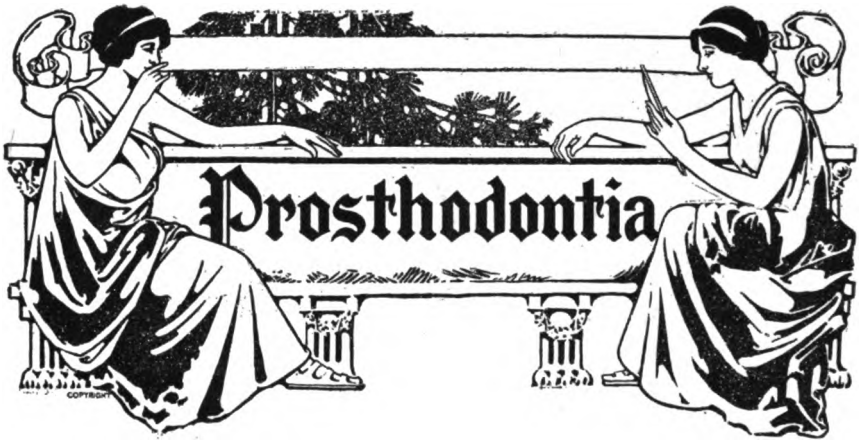
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HERBERT KAUFMAN.

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The Use of Interchangeable and Replaceable Teeth in Crown and Bridgework.

By Hart J. Goslee, B.S., D.D.S.

Because of the frequency with which porcelain teeth and facings which are attached to the supporting structure by means of soldering become fractured, either during the process of soldering or under the stress of mastication subsequently, the more or less general use of "replaceable" or "interchangeable" teeth which are attached by means of cementation only is rapidly becoming a standard practice, and one which is recognized as the safer and better procedure by those who are most expert in crown and bridgework. There is no question but that work so constructed possesses many advantages, chief among which are the decreased likelihood of breakage or fracture, and the facility with which repair or replacement may be effected in the event of such mishap.

The decreased likelihood of fracture, in the first place, is due to the fact that the porcelain teeth not being heated at all are naturally used in their strongest possible form; and, secondly, the influence of the expansion and shrinkage of the metals and solders used in the process of construction, which often accounts for fractured teeth and facings, is avoided; and, furthermore, when the attachment is made with cement the teeth are less likely to become fractured in the mouth because of being held less rigidly and of being better cushioned and protected.

For these reasons it is evident that this method of procedure must ultimately become a general practice.

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In the use of replaceable or interchangeable teeth, their removal from the supporting structure *after* they have been cemented to place may frequently be desirable or become necessary for various reasons. Whenever this is indicated, any of the forms now used may be easily removed by placing the piece in nitric acid and allowing it to remain for several hours, or until the cement has been dissolved. This will permit of their ready detachment without injury to either porcelain or gold.

Also, in all cases where for any reason it may become necessary to subject the piece to the heat of soldering after the teeth have been cemented, each and every tooth should always be detached and recemented before mounting the case.

This procedure is absolutely necessary, because the heat of soldering will disintegrate the cement, and no matter how securely and firmly attached they may seem to be when the case is removed from the investment, it is but a question of time until the action of the mouth fluids upon the already disintegrated cement will cause them to become loosened or detached.

As a safe precaution, therefore, whether it be a new case in which some change has to be made before mounting, or an old one which is to be repaired, if it must be heated and soldered after the teeth have been cemented, then as soon as the soldering has been accomplished the piece should be placed in the acid bath and allowed to remain until each and every tooth may be removed, after which they should be recemented.

This applies to any of the various forms of replaceable porcelain teeth which are cemented to the supporting structure.

Crowning a Fractured Root.

By Dr. W. A. Roberts, Newtown, Pa.

Recently the writer had presented a case where a Logan crown had been worn on an upper left central root. As in many such cases, the canal had been greatly enlarged to admit the crown pin, which had also been much shortened, creating a powerful leverage which finally resulted in fracturing the labial side of the root, the fracture involving half of the length of the root. Bridgework was out of the question for various reasons, so the following plan was evolved:

The loose piece of root was extracted, the canal carefully enlarged a sufficient distance to admit the entire length of a Davis crown pin.

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In the palatal side of the root and parallel with the Davis Crown pin a hole was drilled large enough to admit a platinoid pin the thickness of a sewing pin and an eighth of an inch long. The small pin was placed in position and the crown pin, surrounded with a tapering mass of softened inlay wax, was forced to position. The excess wax was carefully molded over the exposed root surface, and included the exposed end of the small platinoid pin. The wax was carefully carved and removed, bringing with it both the crown pin and the small reinforceing pin. The wax model was cast and placed in the root, which it fit accurately and firmly. With the inlay in position a plaster impression was taken, and upon the resulting model a Davis crown was ground to fit the inlay and the parts then cemented to place.

A Personal Experience with a Lower Denture.

By Loomis P. Haskell, D.D.S., Chicago, Ill.

Personal experience on the part of the dentist is of value to the patient as well as a demonstration to the operator in difficult cases.

This is especially true in the case of lower dentures, when absorption has taken place to such extent that there is only a flat, narrow surface, so that the lingual muscles are attached to the margin of the jaw, and consequently the plate cannot extend below the margin except in some cases at extremities of the jaw. Otherwise the plate is constantly raised by movement of the tongue, and causes a clatter of the teeth so often complained of.

This has been the condition of my own jaw for twelve years. Placing my finger over the margin of the jaw, a little way at the corner of the mouth, holding it tight and raising the tongue, the finger is forcibly displaced. Thus can readily be seen what would be the result of extension of the plate lingually.

In this condition there is nothing to hold the plate in place, as adhesion is impossible. I have found, however, that a flange about one-quarter of an inch wide, extending from the first bicuspid to the posterior margin of the plate, is a great help, as the cheek falls over it and helps hold it in place. This flange must not be down at the margin, as it would be lifted by the muscles, but midway between the margin and necks of the teeth, and grooved a little.

It will take the patient some time to learn to use this. I always tell patients it is the lower plate that is liable to irritate the membrane, and if so, they cannot eat, but must come and have it relieved, but come

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after having it in the mouth for a half day, so that the irritated spot can be seen. It is not always easy to locate the spot on the plate. This is easily done by painting a little moist whiting over the suspected spot and placing the plate in the mouth when the spot is indicated, and the trouble can easily be remedied with a small carborundum.

Years ago I made many cast metal plates. The second plate for myself I made in this manner. After having it in for a short time I leaned forward to talk with a student at the bench. As there was no lingual flange to hold it in place, it could not do otherwise than slide forward. I wore it to bed and it slid to my cheek. I have had no further use for weight in such cases.

In fact, my experience has demonstrated to my satisfaction that weight is not needed upon the lower jaw, and that vulcanite is just as good as anything upon the lower jaw, which is not true of the upper jaw.

Why there is such excessive absorption of the lower jaw I do not know, but the process disappears regardless of what is worn, or even when nothing is worn. This condition did not exist years ago. I think it may possibly be owing to the great increase of pyorrhea. I rarely have a case of a good ridge, as in former years.

In full dentures the anterior teeth should never quite meet; arrange for pressure on the bicuspids and first molars, leaving the second molars free.

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Some Observations on the Development of the Temporo-Mandibular Articulation and Mandible, and their Relation to the Treatment of Distocclusion and Mandibular Retroversion.

By M. N. Federspiel, B.Sc., D.D.S., M.D.

Professor of Oral Surgery and Orthodontia Dental School, Marquette University, Milwaukee, Wis.

Read before the American Society of Orthodontists, Chicago, July, 1913.

I fully realize that I have taken up a subject for study and discussion that will demand much scientific investigation before the profession will be willing to accept my findings. Time, of course, will bring to light more, if my colleagues will assist in developing further knowledge pertaining to the pathological and physiological changes in the temporo-mandibular articulation.

At this time permit me to state that embryological literature pertaining to this area is not authentic. Writers seem to differ in their views—a fact which is also true of the mandible. Anyone who has attempted investigating the growing of the mandible and its joint soon realizes that it is a difficult matter to obtain specimens and far more difficult to make dissections for gross and microscopic study.

The modern treatment of the so-called distocclusion, or Class 2 (Angle), or, as I prefer to call it, mandibular retroversion, is by the use of intermaxillary force and lingual inclined planes. Results are usually satisfactory if these cases are treated during the period of tooth eruption. It is rarely possible to obtain permanent results in such cases if treated after the developmental period.

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Clinical observation during the last ten years has wrought many changes in the treatment of malocclusion and dento-facial deformities. This is due no doubt to the fact that our knowledge of diagnosis has from time to time been modified, owing to the many complex cases that conflict with the preconceived notions of the orthodontist. It is probably admitted by the majority of specialists that orthodontic diagnosis, as it has been viewed in the past, gives little assurance of successful results in a large number of cases.

I do not wish to convey the idea that the thousands of cases treated in the past have not been benefited; but I have observed cases in my own practice, and many cases treated by eminent orthodontists, wherein the results showed a splendid correction at first, and in which after a few years there was a change from an ideal occlusion to a marked malocclusion. Especially is this true in cases diagnosed as distocclusion, or the so-called Class 2.

You will agree that cases in which patients show a distal relation of the lower teeth to the upper have been diagnosed as Class 2, or distocclusion. In other words, such an abnormal relation of the teeth meant that the maxillary arch was in a normal position in the upper jaw, and the mandibular arch was in an abnormal position in the lower jaw, a form of malocclusion known as arch malrelation.

I do not wish to imply that I fail to recognize the importance of normal tooth eruption. It is admitted by all scientists that the normal function of mastication plays an important part in the normal development of the maxillary bones. But I am convinced that many forms of malocclusion and dento-facial deformities are not primarily due to faulty tooth eruption, but to other conditions. This effect is a factor in causing abnormal eruption to be the outcome. In other words, I am more and more inclined to believe that the forces of normal eruption and the forces of normal occlusion are to a large extent regulated through glandular manifestations, which I will take up later, and also to the inequality of the muscular action, as well as to the unbalanced intra- and extra-maxillary pressure.

For a long time I believed that the upper first molar always erupted normally; that if the manibular molar was distal to normal the case should be diagnosed as Class 2 (Angle), or, as Lischer puts it, distocclusion: that to fulfill the highest aim in the treatment of orthodontic cases it is necessary to obtain a normal relation of the inclined planes when the jaws occlude; that the forces of normal occlusion are a factor in permitting the jaws and adjacent structure to develop along normal lines; that the growth of the mandible depends largely on normal eruption of all its teeth.

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Let me call your attention here to the case of a young lady nineteen years old, a Jewess, who came to my clinic. She informed me that she had never had any lower diciduous teeth, and that at the age of twelve years the second mandibular molars erupted. The X-rays showed and there were no other teeth in the jaw. The upper arch contained two centrals, two laterals, one right diciduous cuspid, two bicuspids and two molars. (See Fig. 1.)

Upon inspection and palpation I found that the maxillary bones were well developed—the relation of the molars normal. Examina-

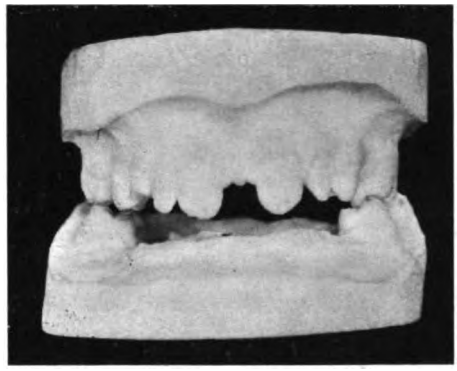


Fig. 1. Shows models of case where there were no deciduous teeth.

tion of nose showed nothing pathological, health excellent. What I wish to bring out is that, notwithstanding the failure to have a full set of teeth, the jaws had nevertheless developed to their full size. The question might be asked, "Would the jaws have developed or have been properly balanced had the young lady been a sufferer from pathologic conditions in the adjacent structure or elsewhere? Would any glandular manifestations or inequality of jaw muscles, etc., have permitted the jaws to develop as they did?".

Medical literature is replete with reports and variations in the development of the skeleton. Thus, for instance, skeletons with eleven or with thirteen free ribs only are not uncommon. The form of the skeleton as a whole and of the individual bones which compose it depends partly upon heredity, partly upon the mechanical and chemical influences to which it is subject during growth of the individual. Abnormal stress of muscular or other origin, and abnormal lack of stress, as in the case of muscle paralysis, both give rise to bones and joints abnormal in form.

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Hypoplasia. Hypoplasia, under development of the skeleton, may be due either to prenatal or postnatal conditions. This may be due to:

(1) Lack of active proliferation or cartilage.

(2) Inactivity in the process of ossification, membranous, subperiosteal or endochondral.

(3) A premature union of epiphyses with the main part of the bone.

(4) Inflammation and other abnormal conditions affecting the growing parts of the bone.



Fig. 2a. Shows a condition wherein the mandible is in retroversion.
Fig. 2b. Shows same patient wherein the lower jaw was shifted mesially giving the patient a normal facial outline.

Usually in cases where there is underdevelopment of the skeleton the long bones are especially affected and appear short and thick. The pelvis and thorax usually small. The root of the nose is broad and frequently sunken in.

Hyperplasia, overgrowth of the bones, is due:

(1) To an excessive activity of membraneous or subperiosteal ossification.

(2) To a prolonged activity of growing epiphyseal cartilages.

Hyperplasia. Hyperplasia may be local or general, and may give rise to a well-proportioned or disproportional enlargement of the skeleton. The causative factor

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in bringing about variations in the position and shape of one or more bones is obscure. It is said that the removal of testicles early in infancy, or congenital absence of the testicles, may lead to excessive prolongation of the activity of the epiphyseal cartilages and hence to giganticism. Phosphorous and arsenic in small doses are said to promote bone growth. Irritative stimulus, such as a blow, and even a small center of inflammation (osteomyelitis, ostitis, etc.), may excite activity



Fig. 3. Mandibular macrognathia. Age 13 years.

in the processes concerned in ossification and induce abnormal growth in size of bone. Some diseases involving both the bones and certain glands have led to the belief that glandular condition is a factor in producing abnormal bone growth.

Modified Development of Maxillary Bones.

While a deviation from the normal relation of teeth will modify the development in the maxillary bones, I am inclined to believe that that modification extends only to a limited area. Permit me to say, in other words, that malposition of the teeth will bring about a deficient development of bone surrounding the teeth. This relates only to neutroclusion, or the so-called Class I.

In arch malrelation known as distocclusion and mesiocclusion a different problem confronts us. In many of such cases it is not deficiency of bone, but rather a malposition of the mandible, or probably

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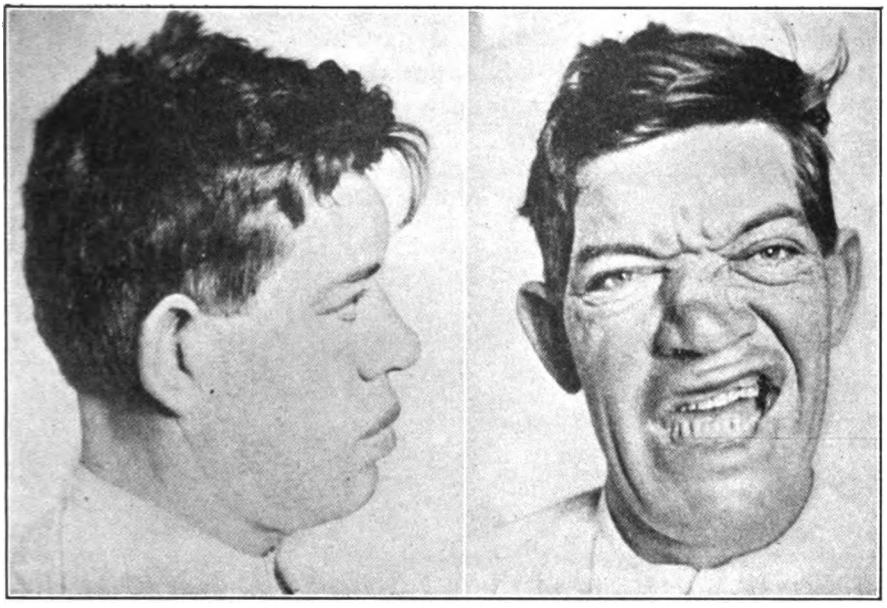


Fig. 4. Note maxillary rather than the mandibular prognathism of the true acromegalic; also posterior position of the ears. (Cushing.)

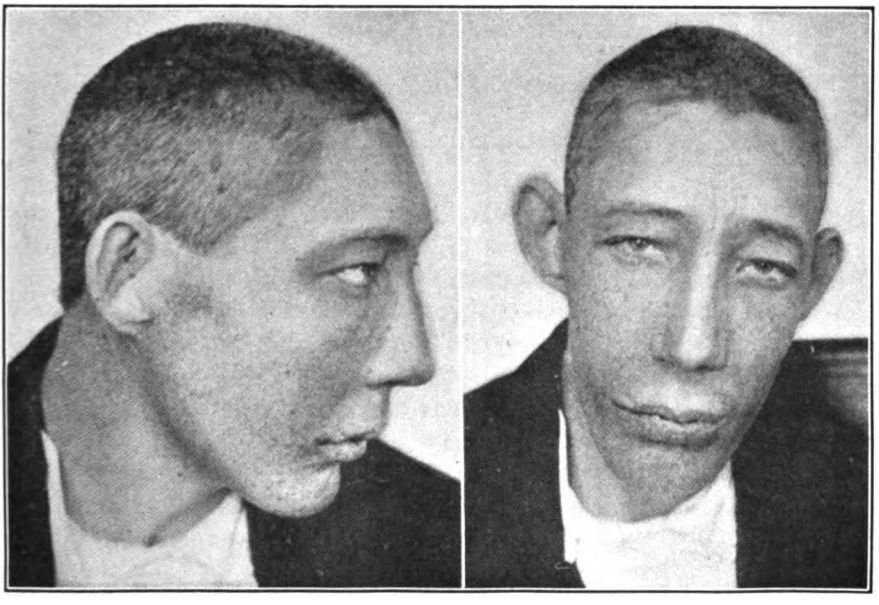


Fig. 5. Left showing marked frontal protrusion, thick lips, etc., in profile. Right, patient in the act of showing teeth while jaws which meet only on the right are held closed. Note the deep furrows of the thickened cutaneous tissues. (Cushing.)

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a deficiency or excessive development of the maxilla. If the mandible is fully developed and contains all of its teeth, and if upon inspection we find the lower arch distal to normal, may we not consider such a case a normal relation of the teeth to the jaw with a faulty occlusion, due to malposition of the jaws? (See Figs. *2a, 2b.*) Or suppose we find upon inspection that the mandible is large and massive in size with its teeth anterior to normal, may we not incline to belief that the growth



Fig. 6. Foetus at 7 months. Note temporo-mandibular joint.

of this bone is regulated by the same force that governs the osseous system? (See Fig. 3.)

Function of the Pituitary Body.

Evidence in medical statistics is fast accumulating to show that the pituitary body, which weighs only from five to ten grains, and is situated near the anterior part of the base of the brain, mysteriously governs the shape, size and form of bone growth. (See Figs. 4, 5.)

Keith describes certain changes occurring in the jaws of man when associated with acromegaly. He states that the growth of the jaw bones is so co-ordinate that the upper and lower teeth fall into correct relation. He further says there are at least two factors concerned in this co-ordination.

(1) A substance evidently derived from the pituitary body which acts on the osteoblasts so that they respond readily to certain stimuli.

(2) Certain forces which act directly on the jaws. These stimuli arise from the forces of tooth eruption and from the forces of muscular activity, which act chiefly on the lower jaw.

This brings us to a discussion as outlined in the title of this paper.

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Development of Temporo-Mandibular Articulation.

While much has been said relative to the development of the mandible, I find that the development of the temporo-mandibular articulation in regard to its formation is far from being understood.

Keibel and Mall, in their book on embryology, claim that this joint is developed between the membrane which covers



Fig. 7. Infant 2 months after birth. Note shallow glenoid fossa.

the condyle of the mandible and the periosteum of the squamosum. In loose tissue between the two a condensation marks the beginning of the differentiation of the "*discus articularis.*" On each side of this "*discus*" a joint cavity develops. Each joint cavity is throughout life lined by fibrous tissue. Beneath the joint periosteum of the mandible and of the temporal bones a thin layer of cartilage is produced. According to Wallisch, in the new-born the *tuberculum articularis* is still underdeveloped and the condyle is flatter than in the adult. (See Figs. 6, 7.) The condyle reaches its definite form and the tuberculum is developed after the teeth appear.

Personally, I am of the opinion that the temporo-mandibular articulation develops in shape and depth during the period of tooth eruption. I am satisfied that its position, shape, size, etc., are influenced by the direct reaction of the muscles which control the mandible.

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I have observed in the history of a number of cases of mandibular retroversion, that the patients, prior to the eruption of the permanent teeth, showed no signs of malocclusion. That after the child began to breath through the mouth instead of the nose the mandible slowly and gradually drifted distally and the upper anterior teeth began to protrude. (See Fig. 4.)

I have come to the conclusion that this change to malposition of the mandible, complicated by malposition of the teeth, is brought about by unbalanced muscular force. Nasal stenosis will, in time, influence the shape of the temporo-mandibular articulation and surrounding area, and if not corrected during the period of growth will render the prognosis unfavorable in correcting mandibular retroversion by orthodontic procedure.

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Local Anesthesia.

By Theodor Blum, D.D.S., M.D.

Oral Surgeon and Dental Radiographer to the New York Throat, Nose and Lung Hospital.

Read under the auspices of Sigma Epsilon Delta Fraternity, at the New York College of Dentistry, January 22, 1914.

In a paper entitled, "*The Kinetic Theory of Shock and Its Prevention Through Anoci-association (Shockless Operation)*," Dr. George W. Crile says: "The word anesthesia—meaning 'without feeling'—describes accurately the effect of inhalation anesthetics. Although no pain is felt in operations under inhalation anesthesia, the nerve impulses set up by surgical operation reach the brain." In this manner traumatic shock is caused; how can we prevent it? "On the kinetic theory, no shock could be produced by traumatizing a territory infiltrated with local anesthetics—a territory whose nerve connection with the brain has been broken by nerve blocking. . . . By blocking nerve connection, local anesthetics protect the brain from local operative injury, but they do not protect the brain against destructive psychic strain; inhalation anesthetics exclude the psychic stimulation of the brain cells, but do not exclude the operative stimulation; and anesthetics introduced hypodermically, being uncontrollable, are excluded on principle. Each anesthetic covers a part of the field, but there is no single agent that alone can produce anoci-association, which is the goal of operative surgery. We therefore do not advocate ether alone, nor chloroform alone, nor nitrous oxide alone; we do not advocate local anesthesia alone, nor morphine and scopolamine alone, nor spinal anesthesia alone, but through selection and combination of anesthetics we aim to attain an anesthesia

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that will exclude all stimuli from the brain and thereby attain anoci-association."

Following this principle, novocain-suprarenin and bromural were selected for operative dentistry and minor oral-surgery; novocain-suprarenin and scopolamine-morphine for major oral-surgery. Scopolamine-morphine diminish traumatic and prevent psychic shock. Post-

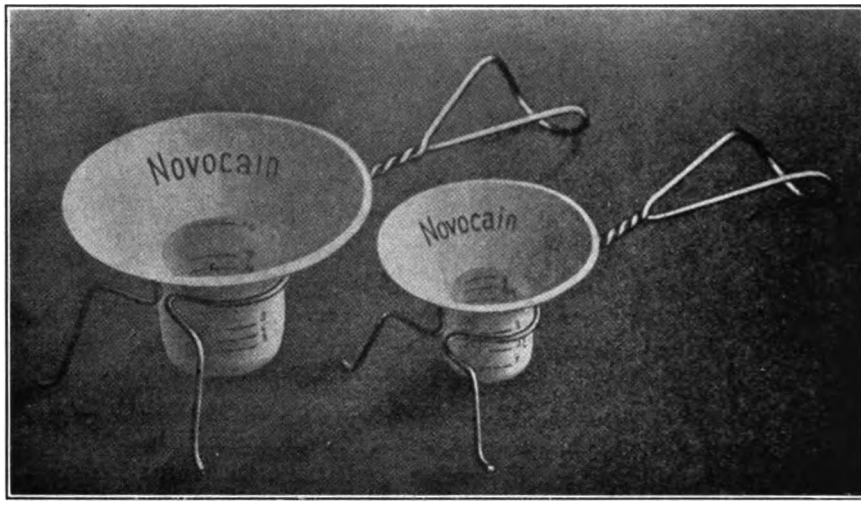


Fig. 1.

operative pain is best controlled by trigemin in minor work and morphine or codeine in major operations; orthoform with iodoform-gauze as a wound-dressing also relieves pain. "Quinine and urea hydrochloride wholly prevents pain if injected into the entire wound. But quinine and urea causes some oedema of the wound; hence one should limit the wound infiltration to cases needing it—*e. g.*, exophthalmic goitre cases—bad risks generally."

Ever since the introduction of cocain for the purpose of producing local anesthesia, quite a number of substitutes have been placed in our hands on account of the drawbacks of cocain.

The classical researches of Braun have established certain factors which are imperative to the value of a local anesthetic. They are:

1st—A lower degree of toxicity than cocain in proportion to its anesthetizing power.

2d—A sufficient solubility in water. The solutions should be stable,

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that is, they should keep without deterioration and be capable of sterilization by boiling.

3d—A complete absence of any sign of irritation. There should be no injury to tissues. The local anesthetic should be easily absorbed without causing any after-effects, such as hyperemia, inflammation, or necrosis.

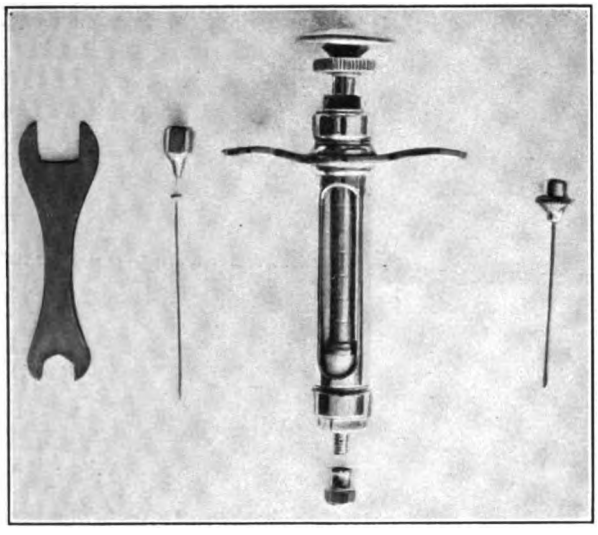


Fig. 2.

4th—Compatibility with suprarenin, the active principle of the suprarenal glands.

Novocain.

Of the many compounds, novocain only is in accord with Professor Braun's postulates. Since the introduction of same, cocain has become entirely obsolete, at least in surgery.

Novocain, while exhibiting the same effect on the peripheral nerves as cocain, is at least seven times less toxic. Employed in normal doses, it affects neither the circulation nor respiration; the cardiac function remains intact.

Novocain dissolves in equal parts of water. The solutions have a neutral reaction, are readily absorbed and may be sterilized by boiling.

Novocain permits the combination with suprarenin without inter-

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fering with the vaso-constrictor action of the latter. The addition of suprarenin to novocain prolongs its anesthetic effect.

All fluids injected hypodermically should be isotonic, and, therefore, the 2% novocain solution, the strength ordinarily used, should be made up with 0.6% sodium chloride solution.

The most convenient form for the general practitioner to use in making up sterile solutions is the tablet. Tablets E of the Farbwerke-

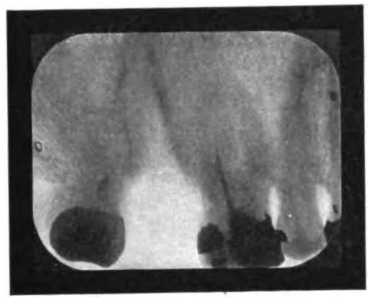


Fig. 3.



Fig. 4.

Hoscht Company contain each 0.02 gram novocain and 0.00005 gram suprarenin. There is now on the market a very convenient help for preparing the solution, namely, a novocain tablet dissolver, made of porcelain. (Fig. 1.)

A stock solution of 0.06% sodium chloride, in distilled water, is kept on hand. 1 c.c. of this is brought to the boiling point in the novocain tablet dissolver. To each c.c. of the boiling solution, 1 tablet is added and boiling continued for a minute or two longer.

At the present time I use only the hypodermic syringe of Freienstein, which holds two c.c. There are only two kinds of needles (after Freienstein) necessary for our work: No. 1 (0.90 mm. in diameter), 40 mm. long for mandibular injections, and No. 17 (0.47 mm. in diameter), 42 mm. long for all other anesthesias; they are fastened to the syringe by a butt. Needles and syringe must be sterilized in plain water and can be kept in glycerine alcohol solution without rusting (70% alcohol: 700 parts, glycerine 300 parts). (Fig. 2).

Local anesthesia is divided into infiltration (or local) and conductive anesthesia. In infiltration anesthesia we force the solution into the tissues we wish to operate upon, whereas in conductive anesthesia the main nerve supplying the field of operation is blocked at a distant point. We shall consider infiltration (or local) anesthesia first.

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Infiltration Anesthesia.

Infiltration anesthesia can be utilized for all the teeth except the lower molars, because the outer plate of the mandible in their region is very thick and heavy and shows practically no foramina. The upper jaw on the other hand is very well adapted to this technique; the

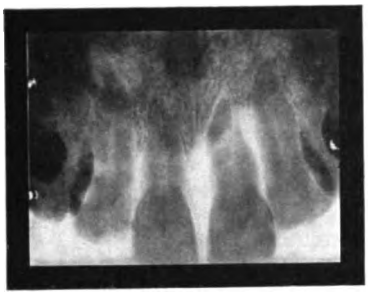


Fig. 5.



Fig. 6.

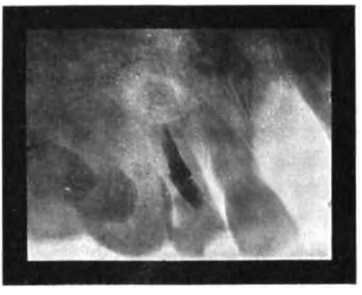


Fig. 7.

bone is more spongy and the inner and outer plate pierced by numerous smaller and larger openings. For a single tooth always inject on the buccal (or labial) and palatal side in the region of the apex—0.75 c.c. and 0.25 c.c. respectively are sufficient—and in a few minutes you can commence to work; but the anesthesia lasts only about half an hour. When a few adjacent teeth are to be extracted, we pierce the soft tissues at the apex of the most interior tooth or root and proceed backward along the bone in a horizontal direction toward the apex of the last tooth to be worked upon, continuously injecting. This method applies only to the buccal side of the upper and lower jaw. The advantage is evident, the mucous membrane is injured only once. In very sensitive patients we

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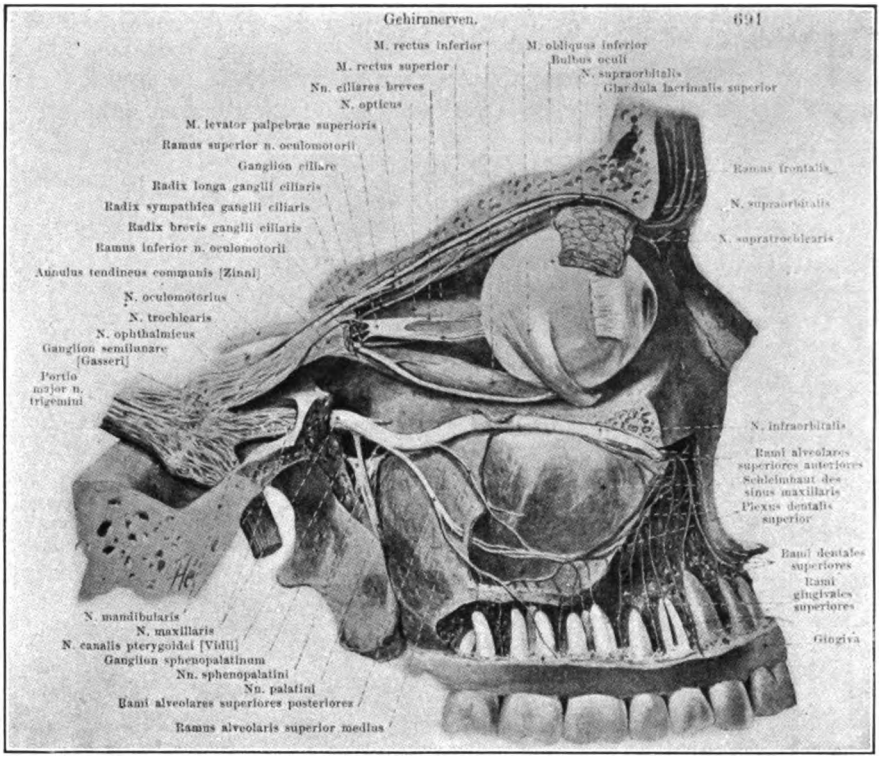


Fig. 8.

run a pledget of cotton saturated with a 20% novocain solution over the mucous membrane, after which the first prick of the needle will not be felt.

A double-rooted upper second molar was painlessly extracted out of a very much thickened alveolus, shown in Fig. 3. With the local injection of 1.5 c.c. of the 2% novocain solution the hidden root of an upper second bicuspid (Fig. 4) was removed. The bloodless field of operation the time at our disposal and co-operation of the patient are a distinct advantage over a general anesthetic, especially in a case of this character.

An oblique fracture of a central incisor is reproduced in the radiograph (Fig. 5). Figs. 6 and 7 show a lateral incisor in the same patient before and after root amputation. In these cases I always insert a piece of cotton saturated with a 20% novocain solution into the nose to anes-

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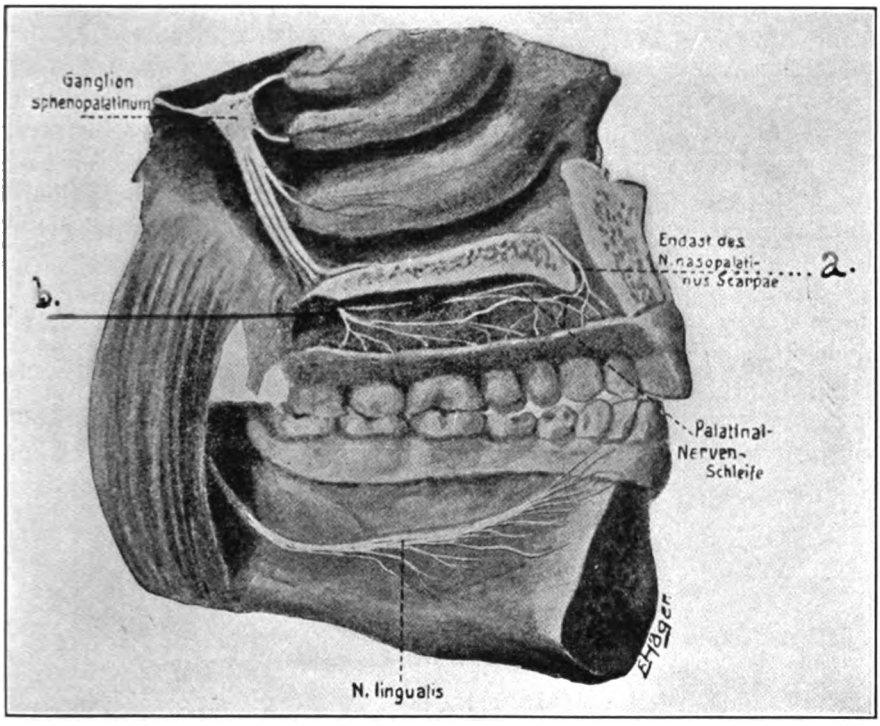


Fig. 9.

thetize the mucous membrane and periosteum of the nasal floor as a supporting measure.

Infiltration anesthesia has but a limited field, which is due to its short duration, the need of repeated punctures of the mucous membrane, and to the fact that it cannot be used in infected areas. The best results are obtained with conductive anesthesia.

Advantages of Conductive Anesthesia.

The advantages of conductive anesthesia are: (1) its long duration; (2) with one or two injections and less of the anesthetic large areas are anesthetized; (3) the infiltration of infected areas can be avoided; (4) the procedure is even less painful, because the solution is injected without pressure and into loose tissues.

For conductive anesthesia in the upper jaw two nerve loops must be taken into consideration, the first of which is formed by the three superior dental branches; the posterior, middle and interior superior dental nerves, originating from the superior maxillary and its termination, the infraorbital nerve. The posterior superior dental branches enter the

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bone through the posterior dental foramina (*foramina alveolaria*) at the tuberosity (*tuber maxillae*); the middle superior springs from the infraorbital nerve in the posterior part of the infraorbital canal, and the interior superior branches just posteriorly to the infraorbital foramen. The above-mentioned nerve loop supplies the bone and all the teeth of the corresponding half jaw, the mucous membrane of the maxillary sinus and the buccal periosteum and gum tissue. The infraorbital nerve



Fig. 10.

—after leaving the foramen—distributes branches to the lower eyelid, the side of the nose and the movable part of the septal cartilage (*alae nasi* and *septum mobile nasi*), and skin and mucous membrane of one-half of the upper lip. At the tuberosity are two to three posterior dental foramina at a distance of one to two cm. above the alveolar border. The infraorbital foramen is situated about 7 mm. below the centre of the lower orbital margin (Fig. 8.)

The second nerve loop consists of two branches from the sphenopalatine ganglion, the anterior palatine nerve making its appearance upon the palate through the anterior palatine foramen and the naso-palatine nerve (Scarpa's), coming through the incisive foramen. They supply the hard palate of one side and the soft tissues covering it. The anterior palatine foramen will be one and one-half cm. to the palatal side of the alveolar border of the first, second or third molar, depending upon the age of the patient. The incisive foramen occupies a position 8 mm. behind the alveolar process between the two central incisors in the median line. This opening is very easily reached, because it lies immediately behind the incisive papilla (Fig. 9).

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To anesthetize the nerves at the tuberosity, we hold the lip and cheek away with the index finger of the left hand and tell the patient to partly shut his mouth; then we take the syringe with the right hand, pierce the mucous membrane at a point corresponding to the middle of the disto-buccal root of the second molar and proceed in the direction of the apex of the third molar until 1½ to 2 cm. of the needle disappears; stay in contact with the bone and inject about 1 c.c. In children, and in cases where the third molar has not erupted, always use the last molar and the one next to the last as guides.



Fig. 11.



Fig. 12.

In about ten minutes the second and third molars will be anesthized, the first in a large percentage of cases, and they remain so for an hour. But the periosteum and mucous membrane on the palatal side are supplied by the anterior palatine nerve, which must therefore be blocked to insure an absolutely painless operation in this region.

Technique for Blocking Anterior Palatine Nerve.

The technique of blocking the anterior palatine nerve at its foramen is as follows: From a point 1 cm. to the palatal side of the alveolar border of the second molar, direct the needle toward the anterior palatine foramen, which lies one-half cm. mesially from the alveolar border of the third molar, and inject about five drops. In a few moments the whole palatal side up to and often including the region of the canine tooth is anesthetized. The anesthesia lasts for nearly an hour.

Tuberosity Anesthesia.

With tuberosity anesthesia the three molars and even the two bicuspids can be anesthetized if you inject enough of the solution. Braun uses 5 c.c. of a 1% or 2% solution. In a case of acute pericementitis and periostitis originating from a second bicuspid, I performed the extraction painlessly by injecting two c.c. of a 2% novocain solution

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at the tuberosity and a few drops at the anterior palatine foramen. As a rule, local injection is used for the removal of bicuspids alone, but this was impossible on account of the acute infection.

Infraorbital Anesthesia.

Infraorbital anesthesia includes the blocking of the infraorbital nerve at the foramen and the anterior superior dental branches. To effect this, place the index finger of the left hand about one-half cm. below the middle of the lower orbital margin—the position of the

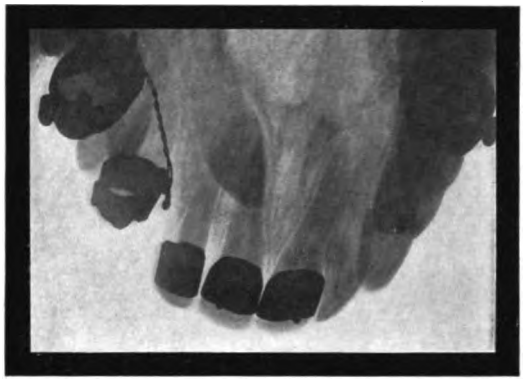


Fig. 13.

infraorbital foramen—and with it and the thumb of the same hand pull the upper lip forward and upward. We now pierce the mucous membrane at its fold above and distally to the apex of the cuspid tooth and, continuously injecting, drop by drop, aim at the foramen, where we inject 1 c.c. A little massage will force the solution into the foramen, even if we did not directly get into it.

Very shortly (ten minutes) all the teeth, the buccal mucous membrane and alveolar process, from the cuspid tooth to the central incisor, are anesthetized. In working near the median line it is well to inject locally just beyond this line to eliminate the anastomosis of the other side. The duration is about an hour. The palatal side is innervated by the anterior palatine and naso-palatine nerves, which must be blocked separately.

To remove an infected cyst (Fig. 10) and amputate the apex of an upper cuspid tooth, infraorbital anesthesia and a tampon saturated with 20% novocain solution in the nasal floor were used, also incisive and local anesthesia on the palatal side with good results.

A combination of infraorbital with tuberosity and anterior palatine

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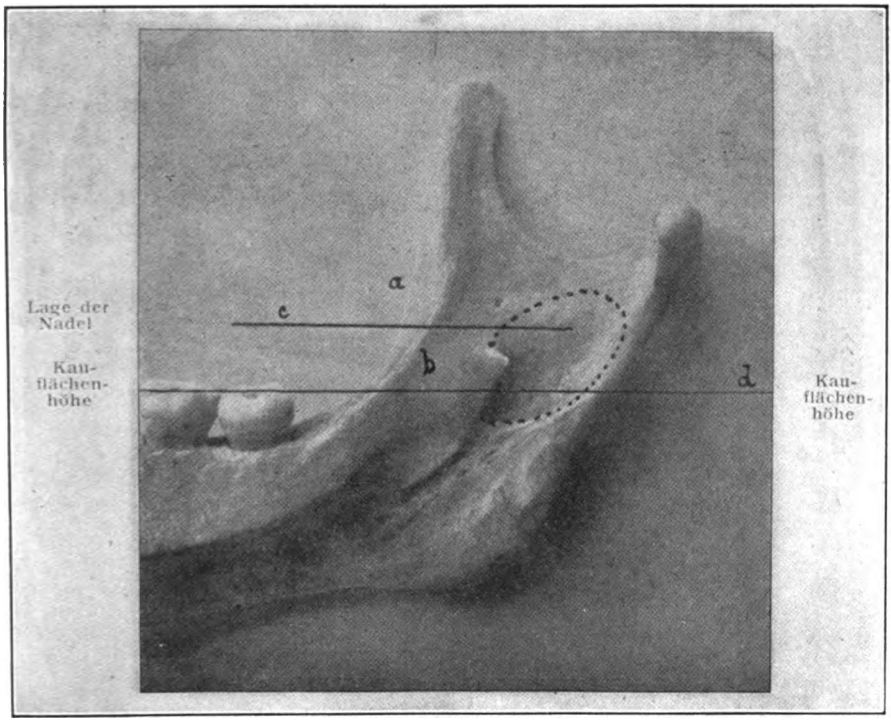


Fig. 14.

anesthesia was employed for the removal of the apices of the two bicuspids, shown in the two following slides (Figs. 11 and 12).

Incisive Anesthesia.

Incisive anesthesia is the easiest of the conductive anesthesias. Look for the incisive papilla, pierce its posterior aspect, direct the needle upward and backward into the foramen and inject about three to five drops. This will anesthetize the anterior portion of the hard palate in the region of the four incisors and posteriorly a little beyond the foramen; the part remains anesthetized about an hour.

Incisive and anterior palatine anesthesia were used for exposing an unerupted canine, which was covered by bone (Fig. 13). Only 0.75 c.c. of the anesthetic was injected, and its effect lasted for the whole time of the operation (half an hour).

Mandibular Anesthesia.

Not only the osteology, but also the anatomy of the soft parts are of great importance for the technique of mandibular anesthesia. Fig. 14 shows the *linea obliqua externa* (a); *linea obliqua interna*

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(b); position of the needle (c); occlusal plane (d); the punctuated line forms the boundary of the *sulcus mandibularis*. The *trigonum retromolare* is well illustrated in Fig. 15, formed by the *linea obliqua externa* (a), the *linea obliqua interna* (b), and the last molar. As we will see later on, the most favorable position for injecting is ¾ to 1 cm. above the occlusal plane of the lower jaw.



Fig. 15.

Following Seidel's example, I prepared a horizontal section of a head (hardened in formalin with the mouth open), 0.87 cm. above the occlusal plane, and not 0.75 cm. as in Seidel's specimen. This specimen is very instructive (Fig. 16): a and b are the external and internal oblique lines, boundaries of the trigonum retromolare; c the ascending ramus of the mandible; d the *sulcus mandibularis;* between it and the internal pterygoid muscle is the *spatium pterygomandibulare,* which is made up of connective tissue and through which pass the inferior dental nerve and vessels; e is the lingual nerve. Fig. 17 gives a fairly good idea of the relation of nerve and vessel to each other, and the inner aspect of the ascending ramus and mandibular foramen.

The inferior dental nerve supplies all the teeth of the lower jaw, the bone, periosteum and mucous membrane, except the lingual mucous membrane and periosteum, which is innervated by the lingual nerve. In

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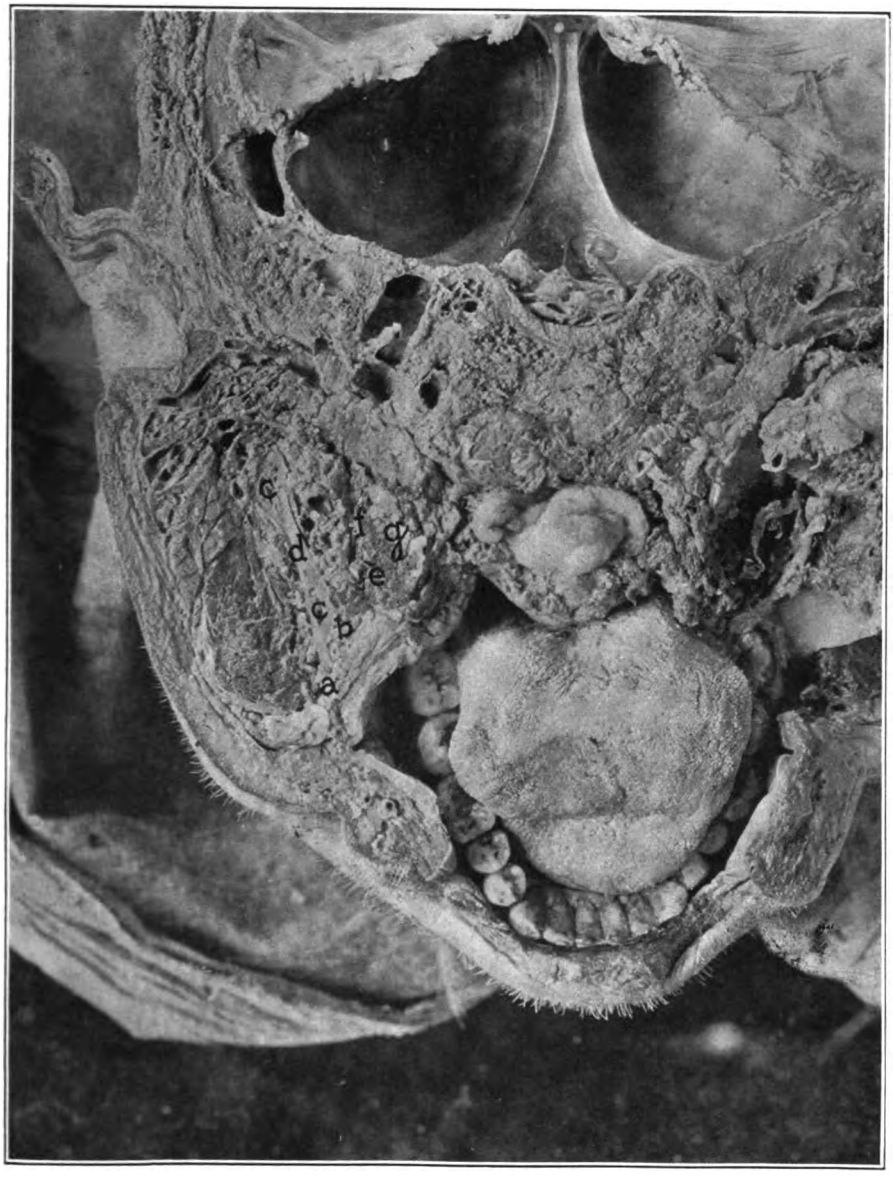


Fig. 16. A and b are the external and internal oblique line; c, ascending ramus of mandible; d, sulcus mandibularis, between it and the internal pterygoid muscle; g is the spatinum pterygo-mandibulare; e is the lingual; f the inferior dental nerve.

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the region below the first or second bicuspid and midway between the lower and alveolar border is situated the mental foramen; through it passes the mental nerve, branch of the inferior dental, to the skin of the chin, also the skin and mucous membrane of the lower lip. At the middle line the inferior dental, mental and lingual nerves of both sides anastomose. In a small percentage of cases the long buccal nerves (*nervus buccinatorius*) supplies the buccal mucous membrane of the molar region. (Fig. 18.)

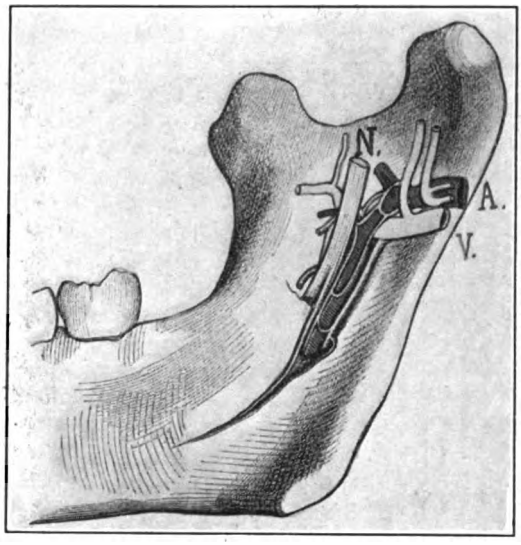


Fig. 17.

Let us say, for example, that we wish to give a mandibular injection on the right side. Have the patient open his mouth; with the index finger of the left hand find the external oblique line. Now place the ball of the same finger over the *trigonum retromolare* in such a manner that the finger nail touches the internal oblique line; retract this finger slightly, paint the region well with iodine; grasp the syringe (filled with 2 c.c. of the above-mentioned solution and mounted with needle No. 1, 40 mm. long) with your right hand, like a pen, and aim the needle 1 cm. above the occlusal plane of the lower jaw through the soft tissues directly at the internal oblique line; retract the needle somewhat and move it mesially until you find no more resistance to proceed backward, *i. e.*, when you arrive at the mesial aspect of the ascending ramus, and inject about five drops of the solution to anesthetize the lingual nerve; get the point of the needle in contact with the mesial aspect of the ascending ramus by turning the syringe to the opposite side and remain so

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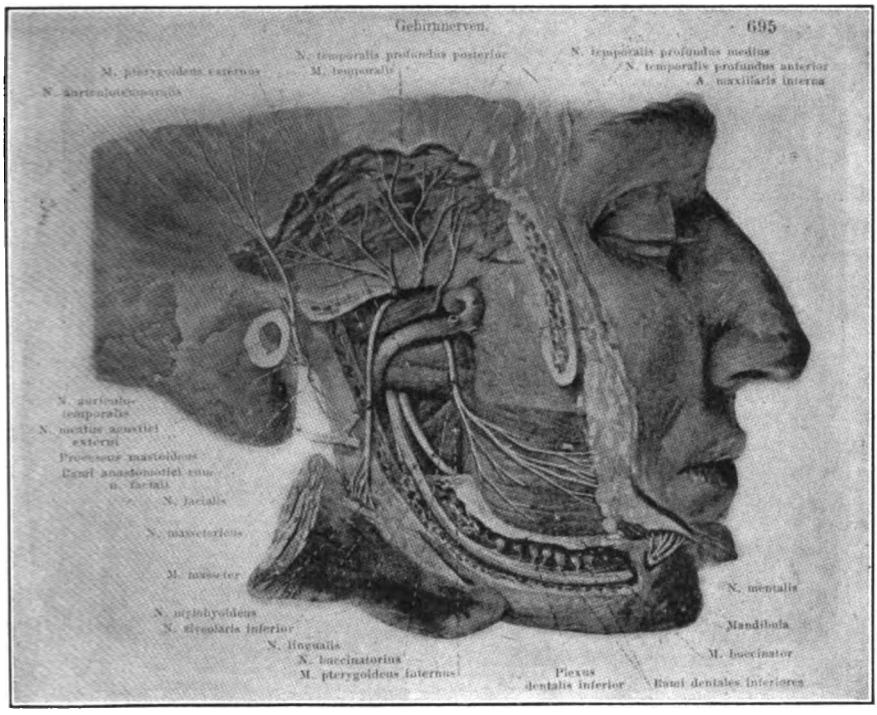


Fig. 18.

while going backward about 2 cm., injecting continuously. Now we arrive at the upper half of the *sulcus mandibularis* and empty the remainder of the solution: 1½ c.c. Whether we inject directly into the nerve or around it (*spatium pterygomandibulare*) seems to be immaterial. To inject the left side, use the right hand as a guide and hold the syringe with the left; a little practice will overcome the difficulty of working with the left hand. (Fig. 16.)

In a few minutes, upon questioning, the patient will tell you that his lips and tongue feel numb (swollen, hot, cold, empty, like electricity, without feeling). In almost every case the molars and bicuspids and the cuspid are completely anesthetized in from ten to twenty minutes. This is best tested by compressing the gum tissue at the neck of the tooth you wish to work upon with a pair of pliers. In about twenty-five minutes, if this procedure is still painful, we must inject locally. The anastomoses of the inferior dental, lingual and mental nerves explain why the middle portion of the lower jaw with the incisor teeth are not anesthetized. To obtain complete anesthesia of half of the lower jaw, the mental foramen of the opposite side must be injected. I have found

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Fig. 19.



Fig. 20.



Fig. 21.



Fig. 22.



Fig. 23.



Fig. 24.

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Fig. 25.

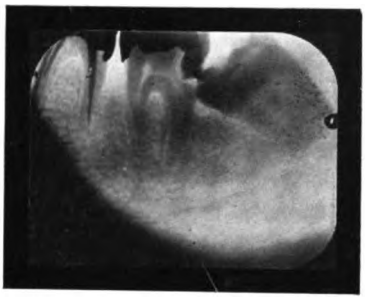


Fig. 26.

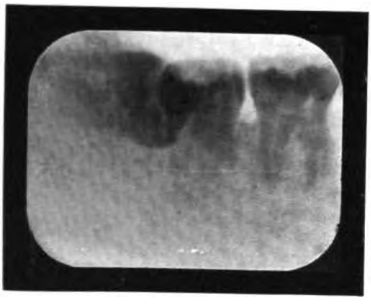


Fig. 27.

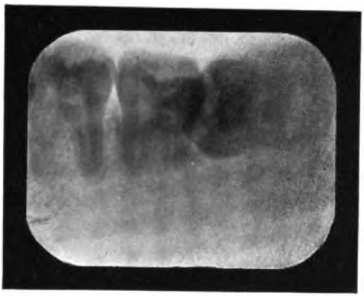


Fig. 28.



Fig. 29.

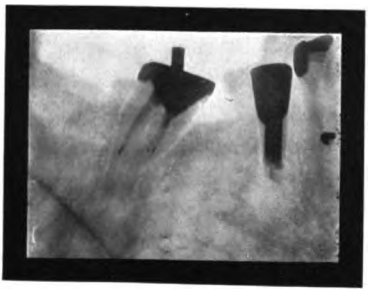


Fig. 30.

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Fig. 19.



Fig. 20.



Fig. 21.

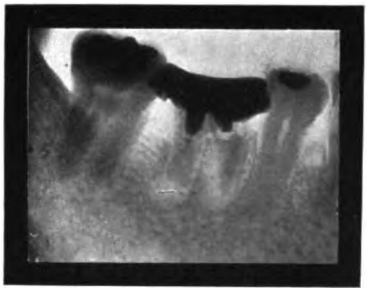


Fig. 22.



Fig. 23.



Fig. 24.

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Fig. 25.



Fig. 26.

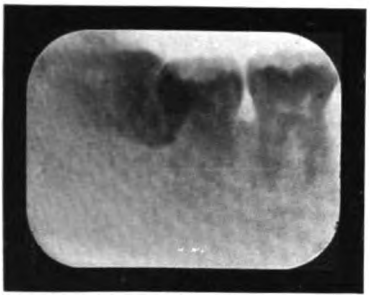


Fig. 27.



Fig. 28.



Fig. 29.

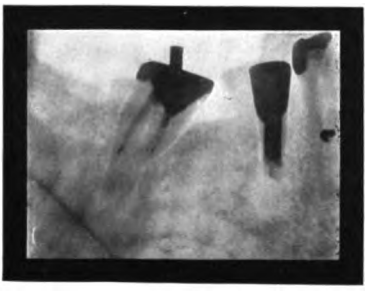


Fig. 30.

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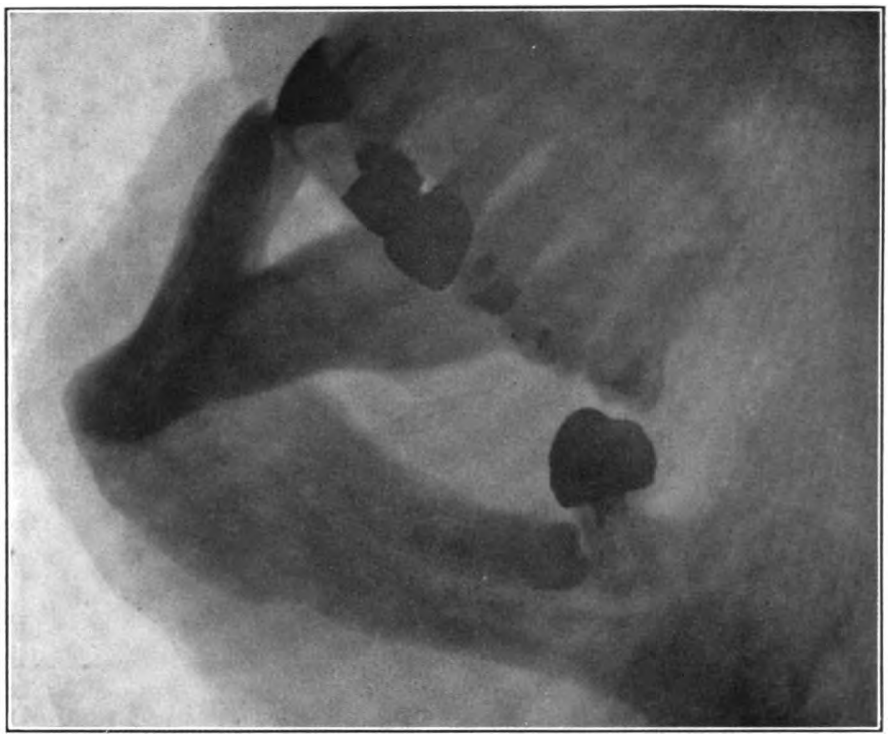


Fig. 31.

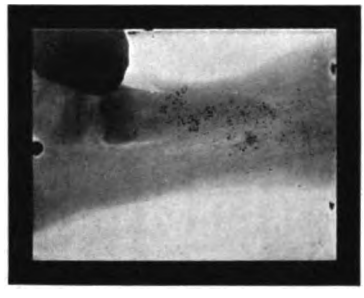


Fig. 32.

NOTE BY THE EDITOR:—*Fig. 32 seems reversed, due to fact that in Fig. 31 the photographic plate is placed externally of the jaw, while Fig. 32 is from a film placed at lingual aspect.*

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mandibular anesthesia to last over two hours (during which time I could operate), and patients have told me that the part remained numb for as long a time as six hours.

The advantages of mandibular anesthesia are: (1) with 2 c.c. of the solution and only one puncture of the mucous membrane the area of six teeth is anesthetized; (2) injection without pressure; (3) the point of injection is far away from the field of operation; and (4) the procedure is less painful than the infiltration method.

The following will ilustrate a few cases in which mandibular anesthesia was successful. The first group (Figs. 19, 20, 21 and 22) shows badly broken-down teeth and roots, which required curetment and careful dressing with iodoform gauze and orthoform. The following illustrate third molar extractions; Figs. 23 and 24 are partly erupted and have infected gum pockets; Fig. 25 is slightly impacted and Fig. 26 is in semi-horizontal position. Two horizontal third molars from the same mandible are seen in Figs. 27 and 28. The patient was given scopolamin-morphine; 45 minutes later a mandibular injection was given on one side, but the last molar was so high in the ramus that local anesthesia was given for the soft tissues above the tooth. After the tooth had been removed and the socket dressed, the other side was anesthetized and the third molar removed; the whole operation was painless and there were no ill-effects from giving both mandibular anesthesias in such quick succession (about 30 minutes), because no muscular tissue was infiltrated. Figs. 29 and 30 show a lower second bicuspid before and after root amputation. A very interesting case is illustrated in the next two plates: An extensive necrosis in the mental region (Fig. 31) and a horizontal unerupted bicuspid, no local injection was necessary, and during and after the operation the patient suffered no pain. The bicuspid is more clearly seen in the smaller radiograph (Fig. 32).

Mental Anesthesia.

Mental anesthesia is indicated for operations on the two lower bicuspids, and, in case of mandibular injection, to exclude the anastomosis of the opposite side.

Palpate for the mental foramen if possible, or locate its position by slight pressure, which will be painful to the patient on account of the mental nerve being in close contact with the bone at this point. Now pierce the mucous membrane of the jaw near its fold and below the second lower bicuspid, proceed downward and slightly forward (considering the fact that the foramen opens distally) to the middle, between the lower and alveolar border, to strike the foramen; inject continuously a few drops and up to one c.c. at or into the opening. It is very advantageous to hold the syringe in the left hand when injecting on the right

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side, and vice versa; the lip is held away with the thumb and index finger of the other hand, placing the thumb as a guide over the foramen. About one-half c.c. injected lingually will anesthetize the mucous membrane and periosteum. The tissues will be numb for nearly an hour.

Mesially to the lower canine we find a shallow depression extending

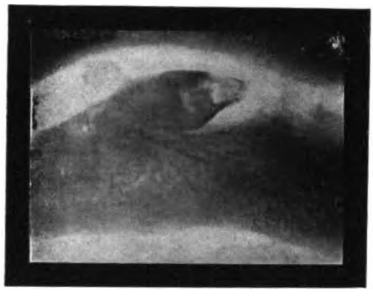


Fig. 33.



Fig. 34.

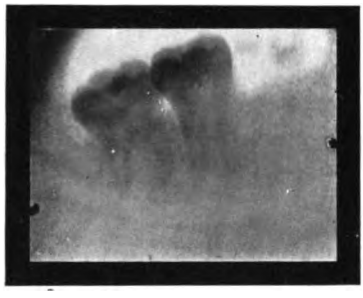


Fig. 35.

from the *protuberantia mentalis* upward to the incisor teeth, the *fossa mentalis* (*fossa canina* of Buente and Moral). Near its lower border are situated a number of smaller and larger foramina for the passage of nerves and vessels, the *foramina mentalia.* Immediately behind them passes the inferior dental nerve. Fig. 15 illustrates the *fossa mentalis* (F.M.), *foramina mentalia* (c) and *protuberantia mentalis* (d).

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To reach these openings, puncture with the needle the mucous membrane at its fold below the cuspid tooth, inject a few drops, proceeding slightly mesially and downward to strike the bone below the middle between lower and alveolar border of the mandible, then slide along the bone for a few millimeters, emptying lc.c.; the lingual side must be injected locally. In a few minutes, if both sides are injected, the area of the four incisors will be completely anesthetized, lasting at least half an hour.

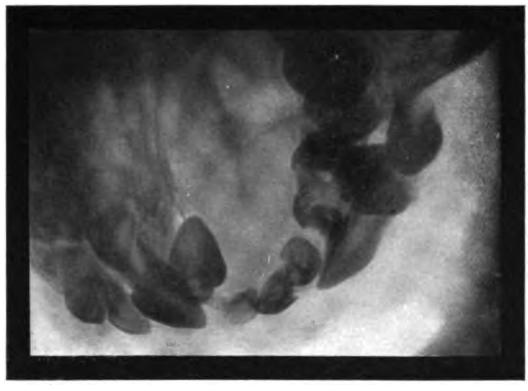


Fig. 36.

Fig. 33 shows an unerupted cuspid tooth in a horizontal position which was removed under this anesthesia; the patient had diabetes mellitus, with a high percentage of sugar, and was given bicarbonate of soda for about four or five days previous to the extraction. The anesthesia had no bad after-effects.

Limitations of Conductive Anesthesia.

Unfortunately, conductive anesthesia has its limitations and contra-indications even for dental operations. The following cases will serve some as examples. The first (Fig. 34) was taken from a patient suffering from an acute pericementitis and periostitis abscedens originating from the lateral incisor; the patient's cheek and lips were swollen and the eye nearly closed. In Fig. 35 we see a partly erupted thrid molar with distal inclination; the overlying gum tissue and the soft tissues in the vicinity were swollen and pus was oozing from between the gums and about the third and second molars; acute periostitis with a swollen cheek and trismus completed the clinical picture. In both cases local anesthesia was contra-indicated. Fig. 36

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was taken from a patient seven years of age, who had a cyst originating from the temporary right upper central incisor root, a rare occurrence. In this case we were compelled to give ether. The patient's age and the doubt as to the extent of the operation excluded the administration of a local anesthetic.

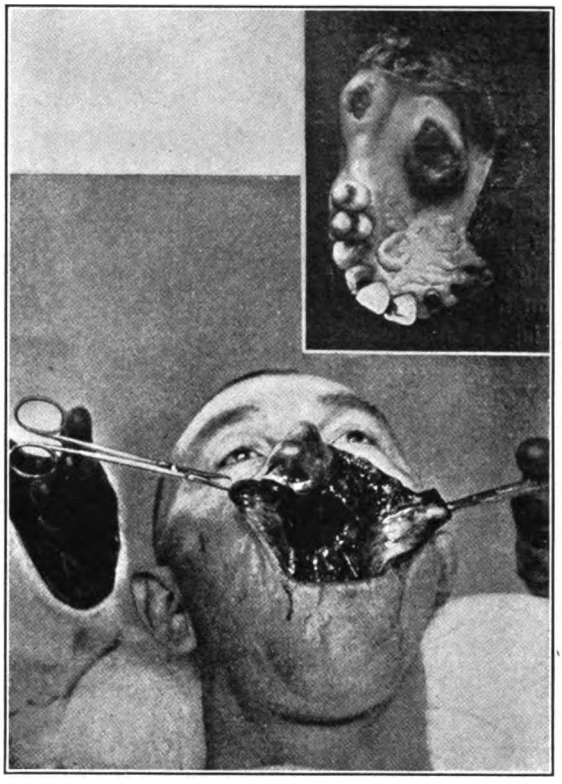


Fig. 37.

Dangers in Local Anesthesia.

What dangers, if any, accompany local anesthesia? Novocain-suprarenin is absolutely harmless in the small dose sufficient for dental operations. Arteries and veins will not be punctured if the solution is injected continuously while proceeding with the needle; but even if when it has occurred it has been found to be a harmless accident (Braun). The same holds good for the nerves; some authors even recommend the injection into the nerve and have never seen any bad effect from it. As far as the needles are concerned, I have never broken

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one. But never insert the needle into the soft tissue up to the butt, because—according to Braun—they break at this point. In case of such accident the needle can easily be removed.

In employing novocain-suprarenin, the patient's life is not endangered. The anesthesia lasts long enough—especially with conductive anesthesia—to eliminate the first severe post-operative pains. A bad

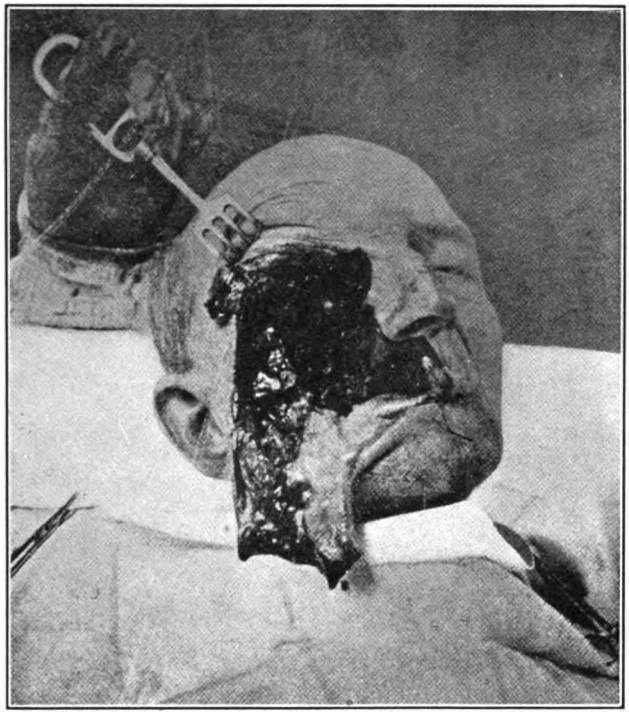


Fig. 38.

and insufficient local anesthesia is harmless; bad general anesthesia is dangerous. "Local anesthesia, therefore, is the method of choice, if with probability, without using too large a dose of the anesthetic, without any unnecessary preliminaries or any unduly elaborate technique, the whole field of operation, not only part of it, can be rendered insensible, if the operator knows the technique of the method and its limitations and if the psychic state of the patient permits the avoidance of the narcotic sleep." (Braun.) The psychic state is only very rarely a contra-indication; even the highly nervous patient is quickly quieted if he sees that he is not hurt. Children who, as a rule, are considered bad subjects

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for local anesthesia, make, in my opinion, just as good if not better patients than adults. I can recall but one instance where a patient refused local anesthesia, and then because a previous attempt by another doctor had proved unsuccessful.

A table to which I take pleasure in calling your attention gives the

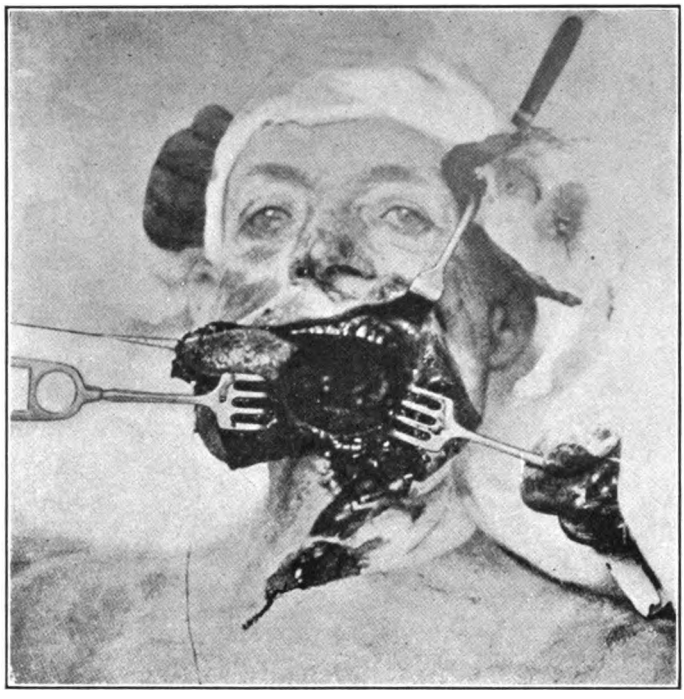


Fig. 39.

Report of the Oral Surgical Department of the New York Throat, Nose and Lung Hospital for the year ending December 31, 1913. Two hundred and four times local anesthesia (novocain-suprarenin) was employed; only twice a general anesthetic had to be resorted to—somnoform for a case of acute periostitis abscedens and ether for the removal of a large cyst originating from a temporary left central incisor in a boy of seven.

I also show three photographs from Braun's book which were taken during the operations. The first one (Fig. 37) was a resection of the superior maxilla for carcinoma of the hard palate; above is the resected part. A resection of the superior maxilla with removal of the contents of the orbit was performed on the next patient (Fig. 38). In the last picture (Fig. 39) the patient's mandible is divided at the symphysis, the

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tongue pulled to the right, a carcinoma of the base of the tongue and of the left tonsil has been excised. If such major surgical operations are performed successfully under local anesthesia with all the benefit to the patient over inhalation anesthesia, this method is certainly indicated for our dental and oral surgery. But we have to know anatomy and pathology, comply with asepsis and acquire the technique of local anesthesia.

N. Y. Throat, Nose and Lung Hospital

DEPARTMENT OF ORAL SURGERY.

(Dispensary hours: Tuesdays, Thursdays and Saturdays at 2 P. M.

Year 1913—Number of Patients 138; (in January one new patient; in December thirty-five new patients).

OPERATIONS:	Without Anesthesia	Ethyl chlorid Spray	LOCAL ANESTHESIA								Somnoform	Ether
			Infiltration	CONDUCTIVE [1]								
				Tuberosity	Ant. palat.	Infraorbital	Foram. mental.	Mental foram.	Mandibular			
249 (Extract., necrosis), etc.	62	2	26	38	38	6	3	2	90[2]		1	
2 (major operations)									1			1

[1] A number of incisive anesthesias were given, but recorded under infiltration-anesthesia.

[2] Six Mandibular anesthesias after Seidel had to be injected buccally.

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Some of the illustrations used in this article have been taken from the above works as follows:

Nos. 37. 38, 39, taken from No. 3.
No. 1, taken from No. 4.
Nos. 8, 18, taken from No. 5.
Nos. 9, 15, taken from No. 6.
No. 14, taken from No. 7.
No. 17, taken from No. 8.
Taken from Dr. A. Kohn.
Nos. 23, 24, taken from Dr. A. G. Asch.

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"The Importance of Blood-Pressure and Pulse Observations During Dental Anesthesia."

By Francis Ashley Faught, M.D.

Instructor in Clinical Medicine, Medico-Chirurgical College, Philadelphia.

Read before the Forty-third Annual Convention of the New Jersey State Dental Society, July 17, 1913, at Asbury Park, N. J.

It has been the function of the medical and surgical professions from time immemorial to allay suffering and cure disease, and that of the dental profession to treat, restore and fill diseased teeth, and by so doing to cause suffering; at least, that is the popular opinion in regard to such matters. Tradition has been rudely upset. To-day the progressive dental practitioner is enabled by means of the newer technic of anesthetic administration to perform many previously tedious and painful operations without pain. The public at large is not slow in grasping the benefit of this wonderful method. The immediate result is that many dentists, in their haste to take advantage and to reap profits of this new procedure, have already or will soon introduce a gas-oxygen outfit, and proceed with its daily use until their inexperience and lack of knowledge results in catastrophe.

When either a dentist or physician undertakes the administration of an anesthetic for the production of analgesia or general anesthesia in any degree, he is taking human life in his hands, and the public, both lay and professional, assumes that he has acquired special knowledge through study and practice, not only of the accepted methods of anesthesia, but also of physiology, pathology and diagnosis, relating to the

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heart, circulatory and respiratory systems. Upon these several points I think there can be no argument.

If a dentist intends to enter this new and lucrative field, he is in duty and honor bound to thoroughly familiarize himself with these branches and to acquire a practical knowledge of the methods employed by those who are at present recognized as qualified anesthetists. Any other course will lay the dentist anesthetist open to censure, if not to criminal prosecution, if from his lack of knowledge or his failure to employ the proper methods, he should lose a case.

Before proceeding further, I wish it understood that I am not an anesthetist, and do not pose as one, but that my familiarity and experience with this work comes from a careful study of the methods of others, together with special work in the study of the heart, circulation and respiratory systems.

I do not come here this evening in any spirit of antagonism toward the employment of anesthetics by the dental profession, but rather as one who has been for some time in a position to make a critical study of the methods of anesthesia and an impartial review of the factors leading up to their sudden popularity, and who is at least partially qualified to offer a word of commendation and praise of the results already attained, coupled with a few words of caution as to the future.

It seems to me unfair to expect the student or practitioner of dendistry to occupy this new field, without an opportunity for adequate practice and instruction, and yet this is what the public is rapidly forcing upon you.

You are all thoroughly aware of the trials and tribulations of the medical student, his long course and the now required hospital internship, in which the opportunity for clinical study, in diagnosis, anesthetics and emergency treatment is almost unlimited; and yet in spite of this, as I have had ample opportunity to see, but few medical students and hospital residents become proficient in the art of anesthetization. It would then appear almost the height of folly for a dental student or practitioner to even attempt to enter this field, jointly with a medical student or practitioner, without the same apprenticeship. Such an opportunity does not exist at the present time, except for the few who have acquired a medical degree, or for those who are willing to take the time for and incur the expense of a special comprehensive course.

Needed Training of Anesthetists.

Unless more attention is paid to special preliminary training, the recent corps of dental anesthetists who have developed since the demonstration of the practicability of combined anesthesia will, I fear, encounter more than one avoidable disaster.

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The first point which I hope to bring home to you this evening is the absolute importance of adequate training for all anesthetists, whether they be dentists or physicians. Briefly this should comprise: thorough practical knowledge of the anatomy, physiology and pathology of the circulation, together with such methods of diagnosis as are recognized to be of value in safeguarding the application of anesthesia and the anesthetized patient. Also a practical knowledge of the relative safety of the anesthetics employed, the methods of their administration and the usual means by which they may cause death. Further perfection in the technic of anesthetization can only be acquired by constant practice under the guidance of competent instructors.

You will readily appreciate that all individuals do not present the same problems to the anesthetist, and that some may be met who are not satisfactory candidates for general anesthesia. You will also appreciate that some persons may bear one kind of anesthesia better than another. If such be the case, it is evident that the anesthetist should be familiar with these conditions and with the methods which will lead him to arrive at proper conclusions under varying conditions.

We are living in an age of progress. This fact is no more evident than in the medical and allied professions. A single decade has so modified our knowledge and altered methods that those who have not most assiduously kept step with the march of progress are fast being left behind. It is well within the bounds of possibility to state that the introduction of the nitrous-oxide-oxygen-and-ether combination, administered by means of elaborate apparatus, forms an epoch in dentistry and that it is probably the most important advance in this branch of the healing profession that has been made in many years. The employment of special apparatus has raised the standard of anesthesia, which demands special knowledge and practice. When such conditions are fulfilled, the whole procedure becomes one of almost mathematical precision, as compared to the older methods of semi-drowning without thought and without experience. These very facts emphasize most profoundly the logical corollary; that the employment of such special procedure places those who practice it in a special class. Membership in this class demands special knowledge and experience above the rank and file of the profession; therefore the public should insistently demand that all those who attempt this special work shall possess the special education and training necessary to carry it on successfully.

In other words, if I pose as a specialist, my work in that branch must be better than that of my neighbor, doing the same work occasionally, but who does not pose as a specialist; and if my results as a specialist do not compare favorably with those of men in general prac-

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tice I open myself to greater censure and greater possible danger of prosecution if unnecessary accidents result.

It may appear an unnecessary repetition, but it seems to me that so many are rushing in to occupy this most attractive and lucrative field that there will be many who will thoughtlessly enter, because of the inducements offered, but whose lack of experience will result in unnecessary accidents, which will throw discredit upon this most practical and humane procedure, that too much cannot be said upon this subject at this time.

The value of the trained anesthetist cannot be overestimated, for I have seen in our large hospitals that patients receive only the most profunctory preliminary examinations, are laid upon the table and literally drowned by an anesthetic, administered by a recent graduate with *no* instruction and *less* experience in the production of anesthesia. The great wonder is that more fatalities do not occur, that permanent damage does not often result, and that those who suffer such barbarism ever regain normal health. I assure you that this statement is not at all overdrawn, for I can show you similar instances at almost any time in any large hospital.

If the present methods of anesthesia, with rare exception, leave so much to be desired, even in medical practice, where anesthesia is often so necessary, how much more careful should the dentist be, who induces analgesia and anesthesia merely as a matter of convenience, sometimes only to allow greater operating speed or to relieve nervous strain in the patients.

Means for Safe Guarding Patients.

Let us now turn for a few moments to the means available for safeguarding patients before and during analgesia and anesthesia; among them is the use of an instrument of precision which I consider a most essential part of the equipment of all those employing anesthesia for any purpose whatsoever.

Clinicians and surgeons have recently come to recognize the great value of the sphygmomanometer in determining the condition of the patient's circulation and systems related thereto before, during and after the administration of anesthetics. The popularity of this test has resulted in the production of a large number of apparatus for its performance. Many of these are quite practical and give good results when properly employed. Your essayist's attention was directed to the importance of this test in clinical work about six years ago, and it was his good fortune to be able to make several improvements in both types of apparatus now employed. These I will take pleasure in showing you on the screen before closing.

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It being possible that some of you are not familiar with the principle and technic of this test, it may not be out of place to devote a few minutes in explanation of it.

The method of blood-pressure testing can best be explained by likening it to a problem in algebra, in which we seek to find an unknown quantity from several known factors. This problem is a simple equation, containing an unknown factor (the blood-pressure), a variable known factor (the air pressure), and several fixed factors (the remaining parts of the apparatus).

Sphygmomanometer.

The apparatus for estimating blood-pressure is known as the sphygmomanometer and is composed of a gauge with a millimeter scale for measuring the air pressure; an arm-band which is pneumatic and which surrounds the arm; a pump for producing air pressure and suitable tubular connections for uniting the whole.

With the apparatus properly arranged upon the arm, as you saw in the demonstration this afternoon, air pressure is raised by means of the pump, until the pressure exerted within the arm-band is sufficient to compress the artery in the arm and so stop the flow of blood to the forearm and hand. This condition is shown by cessation of the radial pulse. We now must have a greater air pressure than blood-pressure. Then if we can, as we do, gradually reduce the air pressure until the first and faintest pulse beat reaches the wrist, the measure of the air pressure at this instant must necessarily equal the blood-pressure. Thus we solve our problem and are enabled by this test to say that the blood-pressure in the case under observation is so many millimeters of mercury.

Time is too short to go into more detail, or to mention the wide applicability of this test in both medicine and surgery. I will therefore confine myself to the subject in hand, namely, the value of this simple test to the user of anesthesia producing drugs, both for purposes of analgesia and general anesthesia.

Use of Sphygmomanometer During Anesthesia.

It is now well known that certain common constitutional diseases produce definite and permanent changes in blood-pressure, and that great alterations in blood-pressure is usually an indication of threatened or approaching danger to life. Thus high blood-pressure may be a sign of Bright's disease, of arteriosclerosis, or of heart disease; while sudden or profound alterations in blood-pressure downward is usually a sign of heart weakness or of failing blood-vessel tone, which may terminate in shock and collapse, or even in death, if allowed to continue unchecked. Thus we find in the blood-

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pressure test a simple and always available means of detecting, before anesthetization, any predisposition to those conditions which the anesthetist has learned most to dread, *i. e.*, apoplexy, uremia, heart failure and collapse, and shock and death.

The value of this test for this purpose is now so well recognized that few surgeons are willing to proceed with the anesthetic or with operative procedures until they are assured of the absence of such tendency and that the patient's circulation is normal.

If the physician and surgeon with their broad medical training so generally use the blood-pressure test, should not the dental surgeon employing anesthetics, with his inadequate knowledge of these matters, be even more careful to avoid unnecessary danger and regularly make this test before producing analgesia and anesthesia?

Effect of Anesthetics on Blood Pressure.

It is known, furthermore, that different anesthetics cause different reactions. Thus nitrous oxide markedly elevates blood-pressure. This rise is in a measure restrained or inhibited by the administration of a proper percentage of oxygen. Ethyl chloride and somnoform almost uniformly lower blood-pressure, and the greater the dose of these drugs used the greater the falling pressure. Another valuable feature of this test, therefore, is its aid in the selection of the proper anesthetic. Nitrous oxide and oxygen for the low pressure and normal cases and somnoform or ethyl chloride for the high pressure cases. To follow such a course must undoubtedly increase the patient's factor of safety, and this can only be done by knowledge of his blood-pressure.

Now for a moment consider the value of the blood-pressure observation while the patient is under the influence of the anesthetic. There is much valuable information to be obtained here. During anesthesia a rising pressure, especially if the initial level of pressure is high, is an indication of danger, while under any conditions a falling pressure will show almost before any other sign that the heart is acting less well, or that collapse or shock are imminent.

Gibson, of Edinburgh, has shown that a falling pressure and a rising pulse rate is a danger sign, and that should the pulse in beats per minute rise above the blood-pressure in MM. Hg., it is always serious unless normal relations are quickly re-established; while the converse is equally true.

Before turning to the few slides, made from charts of cases in actual practice, with which I will attempt to demonstrate these fundamentals, I wish to say a final word in favor of this test, based on its simplicity and ease of performance.

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It is a simple matter, after a little practice, for an assistant to take and record both the blood-pressure and the pulse (counting one-quarter minute) at intervals of a minute or slightly less. I have done it repeatedly in 45 seconds.

I have purposely said nothing about normal blood-pressure and its variations for three reasons: first, because the time is far too short to begin to cover it; second, because current medical literature and recent works on the subject treat of it so fully, and thirdly, for fear that by so doing I would cloud the issue and fail to make my points, because of the confusion which a mass of detail and figures might cause. It is sufficient to remember that the normal blood-pressure in children is from 90 to 105; in adults, from 105 to 145, advancing slightly with age to say 160, above age 50. The pressure in adult females is usually from 5 to 10 mm. below that of males for the same age. We will now proceed to the illustrated portion of this talk.

(Dr. Faught then illustrated his sphygmomanometer and its use with lantern slides.)

Discussion of Dr. Faught's Paper.

Dr. Charles S. Tuttle, Philadelphia.

It has always been a great pleasure to me to listen to one of Dr. Faught's essays. They are certainly to the point. And I have noticed that when the doctor has finished the society, whether it be dental or medical, is usually wide awake, having been held up, as it were, by forceful facts, or, as in this instance, having been lashed for carelessness in a serious matter until we see stars. Yet, how terribly true are these facts which this most able essayist has placed before you to-night—true, not only of our own profession, but also of the medical fraternity. Many instances could I cite which make one wonder at the small value placed upon human life by those to whom it is entrusted.

A few months ago Dr. Faught and I read before a society a paper (which was later published in the *Dental Brief*), warning the anesthetist of careless oversights in the administration of anesthetics, and placing before the profession means of safeguarding such administrations. In my own opinion, it is little short of criminal to subject a patient to an anesthetic without such a safeguard when we have with us the proper instrument. Yet, in many offices where now it is the custom to administer an anesthetic for the alleviation of pain several times each day, this instrument for safeguarding the patient's life is absent, and, I fear, in some may never have been heard of. We still have with us offices

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in which nitrous oxid and oxygen have been administered for years, and there is nothing at hand excepting forceps and water syringes. Our large ocean liners seldom founder, but when one does, without the proper equipment for safeguarding the lives of those aboard, what a howl goes up from the public! and justly so. It is not difficult to call to mind the *Titanic* disaster and the number of lives which might have been saved had this ship been properly equipped. So with you who are entering the field of anesthesia, provide for danger by having in your possession this instrument which, like the barometer, gives warning. The danger may never present, but being prepared for it is like buying an accident policy—one may never break a leg nor have his hand cut off, but it is a protection and a great comfort.

Safety Appliances Used During Anesthesia.

In my own office I safeguard my patient to the very best of my ability, and it might be worth while to tell you what I have within easy reach when about to administer an anesthetic: A steel mouth pry and a conical shaped mouth screw made of threaded rubber; tongue forceps, hypodermic syringe, adrenalin and normal salt solution; strychnine tablets, and last, but by no means least, a Faught sphygmomanometer, which is always used before and after the anesthetic is given, and, in as many cases as is possible, during the induction period.

Somnoform.

It seems well to state here that somnoform plays a valuable and important part in my anesthetic work, and is one much to be desired when a patient presents directly after a hearty meal. You are all aware of what occurs should N_2O & O be administered in such a case. I have never yet had a case of nausea and vomiting when somnoform was the agent selected. On the other hand, somnoform has a tendency to lower the blood-pressure, and it would not be wise to select this anesthetic where lowered blood-pressure already exists. I am enabled to make my selection between N_2O & O and somnoform by means of the blood-pressure test before the administration. I have heard several timid practitioners say, "It will frighten my patient to take his blood-pressure." In my practice I have not found this to be true. A few words of assurance and you find the patient not only willing to submit to the test, but appreciative of your care of their safety. I am employing three anesthetic agents in my general practice, and no patient is ever allowed any before first having the pulse and pressure rate recorded. I have yet to meet with a refusal from anyone.

We know from statistics that deaths are rare under somnoform and N_2O & O, in spite of the fact that I believe they are being adminis-

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tered by hundreds of inexperienced and many careless persons. But the near-accidents and nerve-racking incidents which occur in every-day practice, what of them? We do not hear of them and they seem not to be recorded. At least, I have never yet read of any. They are hushed up and kept out of sight. And they may all be prevented by first making use of a sphygmomanometer and listening to the heart with a stethoscope. To corroborate this statement, ascertain if you can how many accidents have been preceded by these simple tests.

Care from Practice.

Present methods of anesthesia do, as Dr. Faught has said, leave much to be desired and in many ways. A case of interest in this sad direction was recently told to me, and is known only to the patient's family and those present at the operation. The patient, a young lady possessing a fine voice, found it necessary to have her tonsils removed. Her physician employed another medical man to administer ether, and this irritating agent was allowed to flow down the patient's throat. It is presumed that the anesthetist became interested more in the operation than in the administration of the ether. The result? This girl was unable to take solid food for two months and has entirely lost the beautiful voice tones, in fact, even her speaking voice has been thickened. Question: "Is not this anesthetist justly open to criticism?" This also bears out Dr. Faught's statement concerning the untrained anesthetist.

In conclusion allow me to thank you for your attention and Dr. Faught for presenting to us a paper containing so many suggestions of importance just at a time when our profession is particularly interested in this subject. I also want to impress these points upon your minds: Study when possible with one qualified to teach and provide yourself with the latest books upon the subject and safeguard your patient always in the manner so eloquently placed before you to-night by Dr. Faught.

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A Case of Novocain Peridental Anesthesia Followed by Unpleasant Symptoms.

By JOHN S. MARSHALL, M.D., Sc.D., Captain U. S. Army, Retired.

Read before the Alameda County Dental Society.

It is my pleasure this evening to present to you a few notes under the head of "Incidents of Office Practice." My object in doing this is to place before you by the way of caution, a few facts in relation to a remedy that has been most extensively advertised, particularly by our German confrères, as a safe and reliable substance that can be employed for producing local anesthesia with danger of producing unpleasant constitutional effects so slight as to be practically non-existent; and that toxic effects can only be produced by employing very large doses. That it is superior to cocaine for local anesthesia and much less toxic.

The drug to which I desire to invite your attention is Novocain.

This drug is a synthetic product, discovered by Einhorn in 1905. It is in the form of a white powder and is readily soluble in water in the proportions of 1. to 1. It crystallizes in alcohol in the form of small needles which will melt at a temperature of 156° C. It dissolves in cold alcohol in the proportions of 1 to 3°. The solutions do not undergo decomposition at temperatures below 120° C. (Fischer). The local anesthetic effect of novocain is the same as that of cocaine, viz.: it inhibits sensation in the peripheral sensory nerves. It has been claimed to be from six (Prinz.) to seven times less toxic than cocaine (Fischer), hence it has become very popular with dentists and bids fair on this account to supersede cocaine. The addition of suprarenin intensifies the anesthetic action of novocain. After the addition of suprarenin the mixture should not be boiled, as the active principle of suprarenin is rendered negative by the boiling temperature.

Novocain has vaso-dilator properties, but this is controlled by the addition of suprarenin.

Fischer says* "The general effects after absorption of novocain are hardly noticeable, neither circulation nor respiration being influenced. The heart action is not affected." The writer by reason of a personal experience—as a patient—feels it his duty to dissent from these statements in the interest of scientific accuracy.

Enthusiasm sometimes colors our language beyond the point of absolute accuracy, without any intention upon our part to be in any sense misleading or inaccurate. From the experience about to be related, it would seem clear that the above statement of the author quoted is incor-

*Local Anaesthesia in Dentistry, 1912, p. 41.

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rect, misleading and dangerous, as novocain does have a more or less marked constitutional effect upon the respiratory and cardiac centers in certain individuals from doses that are not excessive.

The Author's Personal Experience with Novocain.

The writer is sixty-seven years old, robust, and in perfect health, except for two molar teeth which have been affected with gouty pericementitis—pyorrhea alveolaris, so-called. These two teeth became affected five years ago while I was on duty at the Division Hospital in Manila, P. I. These teeth were situated upon the left side of the mouth and both of them second molars. The upper one was vital, the lower one had been devitalized for twenty-two years and had carried a gold shell crown for twenty years.

These teeth were treated for several months in the usual manner, but with little or no benefit. The upper tooth was later devitalized on account of the extreme sensitiveness to thermal changes, the pulp extirpated and the root-canals filled. The teeth have been treated frequently since my return from the Philippine Islands by expert specialists, but suppuration has never been controlled, nor the disease checked. Constitutional treatment, and a restricted diet have made no impression upon the progress of the disease.

On August 12th the lower tooth became very painful during the night, therefore I called upon a professional friend for treatment. Examination revealed a large abscess between the roots at the bifurcation, and what *appeared* to be a cavity of decay in the distal root which had caused its separation from the crown. When this tooth was treated twenty-two years ago, in opening the canal in the distal root the drill perforated the side of the root at about the middle third. The root canals and the perforation were later filled with oxychloride of zinc. When the tooth was extracted it was discovered that complete resorption of the distal root had taken place.

Administration of Novocain.

Both of these molar teeth were removed under local anesthesia with the following novocain mixture from tablets manufactured by Parke, Davis & Co.

HYPODERMATIC TABLETS

Novocain	1-3 grain
Adrenalin	1-1500 "
Sodium chloride. C-P.....	1-8 "

Two tablets were dissolved in 40 minims of distilled water, and injected—by the peridental method—into the tissues around each of these teeth. The extractions were absolutely without pain. Upon the extraction of the left lower second molar, a disto-proximal cavity of decay

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was discovered in the first lower molar, beneath a large amalgam filling. Upon removing the filling it was found necessary to extirpate the pulp, which was done after a third injection of two tablets in 40 minims of distilled water. This also was accomplished without pain.

Unpleasant Symptoms After Novocain.

Following the second injection there was a slight increase in the pulse rate, accompanied by an acceleration of the respirations and full deep breathing of expulsive character. These phenomena passed away in from three to four minutes. Upon the third injection the same phenomena were repeated and subsided in about the same period of time. All of these operations consumed about one hour. Upon returning to my home I was somewhat fatigued, but had no unpleasant symptoms other than a slight soreness of the mouth in the region of the operations. Ate a fairly good dinner at 6 P.M. At 8 P.M. malaise was quite well marked, accompanied with slight headache and chilly sensations. Drank 2 ounces of whiskey and retired with a hot-water bag at my back. Had a moderate chill lasting about five minutes and a restless night, but no pain.

Rose at 7:30 A.M. Ate a light breakfast at 8 A.M., of fruit and cereals. At 9 A.M. was feeling fairly well except for a sense of malaise, but started on my usual morning walk of two or three miles. When about one-eighth of a mile from home, was seized with a feeling of constriction in the region of heart and forcible breathing—the same feeling that is often experienced by mountain climbers when in high altitudes, and which was once experienced by the writer many years ago when on Pike's Peak in Colorado at an elevation of 14,145 feet.

My pulse beat is normally 68. At this time while on the street it rose to 75. On account of my condition, the outward journey was completed by street car. After being seated for a few minutes the unpleasant symptoms disappeared. The return journey was made on foot, but at a slower pace, with no return of the unpleasant symptoms. The feeling of malaise lasted all that day. The following day I was as well as ever.

Although two grains (0.13 gm.) of novocain was used it is estimated that at least one-half grain (0.03 gm.) was lost from leakage around the loosened teeth, so that these effects were produced by one and one-half grains (0.09 gm.) of the drug. The average dose of the drug is one-half grain (0.03 gm.) (Prinz.) but "6 grains (0.4 gm.) and even 12 grains (0.8 gm.) have been injected, followed with only slight intoxication accompanied by optic disturbances, deafness, loss of energy and headache" (Fischer).

The writer, therefore, received *three* average doses, in all one and

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one-half grains (0.09 gm.) of novocain during a sitting of about one hour, but much less than the maximum dose for subcutaneous injection which is from 6 grains (0.4 gm.) to 12 grains (0.8 gm.).

Precautions Recommended.

It would therefore seem wise to modify the statements in relation to the absence of constitutional effects; and the writer would suggest that equal caution should be exercised in the use of novocain that is employed in the administration of cocaine.

The symptoms, in this case, cannot be attributed to surgical shock as no pain was experienced at any time during the operations. Neither can it be fairly attributed in this case to psychic phenomena, as it might be in an individual with a neurotic temperament. We must, therefore, conclude that the symptoms were produced by the toxic action of the drug. It is possible, of course, that the writer possesses an idiosyncracy against novocain, but this is hardly possible as cocaine, which produces similar physiologic symptoms and which he has taken several times has never produced any unpleasant effects.

It is hardly possible that the strength of the drug was *unreliable*, as the tablets used were taken from a bottle from which several patients, before and since, have been anesthetized without unpleasant symptoms. These symptoms may have been caused by the adrenalin, but if this drug was the cause they should have been manifested almost at once, or at least before the next day. The principle effects of adrenalin are to accelerate the pulse, increase the blood pressure, and stimulate the vaso-constrictor nerves.

There was no symptomatic indication of an increase in the blood pressure, increase in the pulse rate, nor feeling of mental exaltation or intoxication during the operations nor immediately afterward. An overdose of adrenalin would be likely to cause a sense of fulness in the head and perhaps headache, but neither of these symptoms developed.

The feeling of constriction in the region of the heart, the labored breathing and the increase in the pulse rate, did not develop until some eighteen hours after the injections, while the feeling of malaise did not manifest itself until some five hours after the last injection. The writer is therefore of the opinion that the unpleasant symptoms developed in his case were due to a *cumulative* effect of the drug, and he would suggest that in the future the dose of the drug be not repeated at the same sitting. In the employment of cocaine as a local anesthetic he has never allowed himself to repeat the dose at the same sitting, and to this, in considerable measure, lies the fact that out of several thousands of administrations of cocaine for similar operation, and also for extensive surgical operations upon the face, mouth and jaws, he has never had a case that developed the toxic symptoms of the drug.

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Septic Dentistry.

In August, 1911, *Current Literature* published an article entitled, *"An English Physician's Denunciation of American Dentistry,"* the physician being Dr. Hunter. The magazine article did not fairly relate what Dr. Hunter really did say, but the American dentists sounded the tocsins and flew to arms to defend themselves against the charge that septic conditions in the mouth could be traced to American dentistry. All of which was most admirable from the viewpoint of national pride, even though not quite defensible from a standpoint of fact.

An editorial dealing with this controversy appeared in ITEMS OF INTEREST in November, 1911, in which it was pointed out that as long ago as 1901 Dr. Weston A. Price called attention to the radiographic evidence that dentists in this country were not properly treating root canals, with the result that abscessed conditions supervened (ITEMS OF INTEREST, June, 1901, pp. 458-472). Also that Dr. M. L. Rhein had published a similar communication in 1908 (ITEMS OF INTEREST, November, 1908, pp. 833-855). That Prof. I. N. Broomell had warned against placing large masses of gold near to the pulp, indicating the pathic sequellae that might be expected (*Dental Cosmos,* April, 1910, pp. 389-403). And that Dr. Herman E. S. Chayes had published an article illustrating unsanitary bridgework done in this country, under the title,

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"*Empiricism in Bridgework*" (ITEMS OF INTEREST, October, 1910, pp. 154-155).

Comment was made that none of these articles had aroused any protest, nor so far as could be noted had they produced any betterment of conditions.

In this same volume (ITEMS OF INTEREST, May, 1911, pp. 339-351) may be found an article by Dr. Clarence J. Grieves, entitled *"Systemic Pus Poisoning Associated With Diseased Dental Apical Regions."*

So far as the writer knows, this was the first important utterance by a dentist attributing arthritis to alveolar abscesses. Since that time, however, tremendous masses of evidence have been compiled supporting this view.

The latest lecture on this subject was delivered at the February meeting of the First District Dental Society by Dr. Hartzell, who gave the histories of a number of arthritic lesions attributable to mouth infections. Several physicians were heard in the discussion which followed, the most painful moments for the dental audience arriving when Dr. Byron C. Darling threw upon the screen numerous radiographic records of—let us not say American dentistry, even though it was dentistry done in America, all of which he had diagnosticated as the direct causes of the direct ultimate results—mainly arthritic in character. A few of Dr. Darling's radiographs are reproduced in this issue, grouped together and published as a frontispiece, in the hope that by this means the attention of dentists will be seriously attracted to the great menace that is threatening the fair name of our profession.

Glance at the illustrations. In Fig. 1 we see an extensive piece of bridgework attached to roots, one of which is not filled at all, while the other contains a post, but no apical filling, though, of course, there is an apical abscess. Fig. 2 shows a shell crown, carrying a "swing" placed over a living pulp, perhaps, which promptly died, resulting in an abscess. Fig. 3, also called sanitary or self-cleansing bridge. Note the awful abscess resulting from the septic condition of the unfilled roots. Figs. 4 and 5 are two more specimens of septic bridgework. Figs. 6, 7 and 8 are specimens of septic crown work. Crowns placed on roots with the apices unfilled. No dentist with any pride in his profession could have

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been present while this medical gentleman exhibited these specimens of gross incompetence without feeling his cheek glow with shame.

But a just feeling of shame at such an exhibition will not suffice. For years the members of the dental profession have been clamoring for recognition by the medical profession. At last we have reached the goal. The medical man is increasingly willing to confer with his dental confrere; to listen to the statements of dentists that the medical man should examine the mouth as a possible portal for the entrance of disease. And, lo! When the medical man at last does make a practice of examining the mouth, he does indeed find the explanation of diseases which heretofore had been unexplainable, and among the causes of these diseases he finds septic conditions which he suspects may be traceable to dental incompetency.

At present, the possibility that arthritis and other diseases may have their origin in septic areas about the roots of filled teeth is scarcely more than a probable hypothesis. But it is not impossible that within a few years cold science will have changed this from a theory to a proven fact. If so, then, in a case of arthritis traced by a physician directly to an improperly filled root canal, there is little doubt but that the dentist who imperfectly filled the root, thus initiating the septic lesion, may be mulcted in heavy damages as a malpractitioner.

This is no fancy flight of the imagination. The relation between unfilled roots and arthritis is becoming closer day by day. An increasing number of physicians when treating this disease are insisting upon radiographic examinations of all teeth carrying large fillings, crowns or bridgework. In such manner were the radiographs shown by Dr. Darling brought into existence. They were all in the mouths of persons suffering from joint disease. Let this method of mouth examination by medical men go on but awhile longer, and if the radiographic records continue to be found as Dr. Darling and others report, a stigma will have been placed upon dental practitioners as causers of systemic disease. The only remedy lies in more skillful root canal treatment.

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I HAD EXPECTED to meet a few choice spirits in the Grill of the Hotel Biltmore, New York's new five-million-dollar inn, but none was there. Oh, yes! There were choice spirits there in plenty, but I was not thinking of that kind. But now that you mention that kind of spirits, that hotel is so close to the Grand Central Station that they could appropriately hang out a sign reading: "First Chance." That would be a novelty in New York, though common enough in Texas.

RETURNING TO OUR MUTTON (it was lamb that I ordered, but mutton that was served), when I found the place deserted of my kind, I was tempted to abandon the millionaire atmosphere and go over to a Child's Restaurant. No! I do not mean a children's restaurant, but a Child's restaurant, just as I wrote it, though if I followed the current fashion here in New York, where everything edible, and much that is not, is *à la Française,* I should say *Un Café des Enfants.*

HOWEVER, HAVING ordered my chop, I kept my seat and nursed my grouch. A man is so likely to feel that way when dining alone; he is in such bad company. You are wondering what all this has to do with teeth! Well, let me assure you there is no place where one is more apt to think about teeth, than in an eating room, especially when one orders a chop. Did you ever think backward? Don't know what I mean? Let me explain. A thought comes into your mind and you ponder over it, but did you ever analyze the thought, seeking to trace the sequence of preceding thoughts, which had, as it were, brought the last thought into existence. Try it sometimes. You will find it entertaining.

I HAD HARDLY bitten into that lamb (mutton) chop when I thought of rubber; in fact, of rubber dam. I had a little lady from Boston once, a young miss of some ——— summers; they never say just how many in Boston; they "keep their own statistics." But this little Boston girl

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somewhat abashed me by asking: "Do you use elastic profanity?" For a moment I did not know whether to say "Yes," or "No," so I said: "Sometimes."

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SINCE THEN it has often occurred to me that the rubber dam can be used in such a way, that it would require very elastic profanity if the patient were to express his (or even her) thoughts, and keep nothing back. To revert to my own thoughts, "Why was it that I thought of rubber?" I admit that the lamb was mutton, but it was not tough. Tracing backward I analyzed it thusly: In the first place, the men who had promised to dine with me were dentists. Ordinary courtesy compels me to concede that much. But thinking of them as dentists, led me to think of the sort of dentistry that they do; and from that I thought of the sort of work that they do not do, but which they ought to do; and it then occurred to me that when they do not do the sort of work that they ought to do, that they do their patients. That, of course, is slang, and I never use slang when I am writing, nor when I am speaking. But this time I was thinking, and one cannot always edit one's thoughts.

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ARRIVING THUS at the point where I was forced to admit that my dentist friends are unjust to their patients when not doing thorough work, I grasped the important corrolary, that they also are unjust to themselves. Because as a wiser man than I has said, "Practice makes perfect," or I might add with particular application to our specialty: "Practice makes perfect work more easy, and thus produces a more perfect practice." Just you digest that, and if your mental metabolism is not faulty you should obtain considerable nutriment out of it.

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THEN CAME another thought. A great many dentists do, or do not do, certain things on the ground that they are considering the comfort of their patients, whereas, if the truth were known the real actuating impulse is their own convenience. For example, the man who fills his patients' front teeth with white gutta-percha, at five dollars the first year, six dollars the second year, seven dollars the third year, and so on as the cavities increase annually in size, tells you that he is practicing painless dentistry. But I tell you that he is practicing profitable dentistry, and the patient gets very little of the profit.

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BESIDES THE GUTTA-PERCHA man, there is the dentist who never uses the engine; and the fellow who caps a pulp because it is so painful to "kill the nerve"; and who mummifies the "dead nerves, because Nature can fill a root canal so much better" than he can. Which, by the way, is true. And the fellow who—— Just here the waiter brought me my meal. I cut off a bit of the chop, put it into my mouth, and thought of rubber. But, you see, the chop really had nothing to do with the rubber idea, I being at the Biltmore, and all that.

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THE FACT IS my sequence of thought, and the absence of a particular one of my friends, made me think of those fellows who boast that they never use the rubber dam. "The patients hate it so!" Wow! Yet a

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large number of these non-rubber-dam-dentists (leave out the first two syllables of this compound word if you like, and get even closer to my idea); a large number, I say, have beautiful electric, nickle-plated sterilizers, on nice white-enamel stands. And a girl all in white, to bring the sterilized instruments, in a white porcelain-lined tray, over to the clean glass dental bracket, where the dentist himself in white linen pajamas, with hands all freshly scrubbed with boiling water and ethereal germicidal soap and dried on a use-and-throw-away-paper-towel, proceeds to undertake a perfectly aseptic operation. And none of this is kept secret from the patient, either; because the sterilizer is right over there by the front window, where the light is good; and the girl in white is a live one, and good to look at; and the dentist himself explains that the worst bacteria of them all propagates every twenty minutes, and, consequently, the only safe way is to boil the instruments every twenty minutes. Because, don't you see, this keeps the sum total of the bacterial population of that office down to one. And that one poor old streptococcus has been around the place so long that he is perfectly tame, and warranted not to bite. And there you are! What more could you ask for in the way of asepsis?

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AND THEN that perfectly sterile dentist (*en passant,* as our French friends say, a sterile dentist is a dentist who is barren of real logical thought); will, whatever he is, he proceeds to operate with all those perfectly clean instruments, and with those perfectly clean hands, in a mouth so filled with bacteria, that if they were only visible, they would make the place look like a public ball room with streptococci, pneumococci, bacillæ, spirrilli, micrococci, spirochætæ and their friends doing tangos and turkey trots all over the gums, tongue, and teeth. And he does this without isolating the field of his operation from all these dangers with the rubber dam. And he boasts of it! And he eschews the rubber dam in the interests of his patients! And he calls himself a dental surgeon! Surgeon, mind you!

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"OH, DAMN!" Like a minister of the Gospel who was recently summoned before his Church Committee because he remarked, "There are things a damned sight worse than dancing"—let me interject the information that when I say "Oh, Damn!" and when I repeat "Oh, Damn!" I do so in a purely biblical sense, and with the hope of planting a seed in the minds of the younger generation of dentists, that may produce a harvest worth garnering.

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GRIEVES, HARTZELL, RHEIN and others have taught us the dangers of infecting the entire system, by permitting abscesses to remain at the apices of tooth roots. How much more reprehensible, then, must it be for a dentist to actually cause such a condition! In view of the awakening of the medical profession to this danger which their patients meet at the hands of dentists, the dentists must be aroused to the gravity of the situation, and the fundamental and primary dogma should be that root canal work must be done with every safeguard against either infection or reinfection. It is, therefore, obligatory that the tooth upon

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which the operation is to be performed should be isolated from its surrounding septic environment. And this can only be done with the rubber dam.

"THIS IS IMPOSSIBLE sometimes," you say. Or, if you do not say it, you think it. Anyway, one of my friends said it, and that is why I asked him and a few others like him, to meet me that night at the Biltmore Grill. I wanted to talk this over with them "Around the Table." I wanted them to have a chance to answer back, because I had intended to tell them how to do it. But they did not arrive. Even so, why should I not tell how to use the rubber dam, where it is impossible to use it? I can send them marked copies of this issue of ITEMS OF INTEREST, and perhaps when I next ask them to dine with me, they will come, and tell me how to do something. You see, I am a great believer in reciprocity.

I SAID A WHILE BACK that practice makes perfect. I have been using the rubber dam wherever possible during all the years of my practice, with the result that year by year the impossible cases are fewer and fewer in number. Just at the moment the only condition which occurs to me, in which I could not apply the dam, is where an erupting tooth is carious, though only partly erupted. In such cases it is not common to find root canal treatment needed and temporary fillings can be inserted until eruption be completed, when the dam may be used and permanent work introduced.

LET US THEN consider a few of the most difficult cases; conditions in which for the sake of sterilization the dam seems obligatory, and yet where it seems almost impossible to apply it. I cannot do better than to relate the first case in which the solution of this problem occurred to me.

BUT BEFORE I DO THAT let me give notice. It matters nothing to me if some of you readers have done this "twenty years ago." And I am not telling this to claim any credit for solving the problem. If a lot of you have done it before, I do not recall having seen it in print, and it is worth printing. And even if it has been in print, it is worth printing again. Perhaps others, like myself, have never heard of nor seen the method before. So understand, I do not claim that this will be new to all of you, but I do think it will be new and useful to a number of you; and what is of vastly more importance, to a great many patients.

A PATIENT some time ago applied to me with his mouth in a most unhygienic condition, and suffering pain in a right lower third molar. The first and second molars had been extracted. The third molar wore a crown, though it was no kingly headgear. A radiograph disclosed unfilled root canals, and two "blind" abscesses. Removal of the crown exposed the fact that a distal cavity, extending well below the gum margin, had been crammed (not filled) with gutta-percha. Removal of all cement and gutta-percha, left the root with very little of its wall

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standing above the gum margin. The roots were long, and solidly fixed in the jaw, and if health could be restored would serve well for a bridge abutment. But the mouth was exceedingly wet, tongue active, and patient restless.

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THE EXTREME NECESSITIES of the case suggested the remedy. A German silver band was fitted around the root with an extension distally which passed sufficiently below the gum margin to engage the margin of the root cavity. With cement rather stiff to hasten setting this band was cemented to place, and held firmly in position till the cement had set. Enough cement was removed from within the band to permit access to the root canals, and with a dressing in place, covered with gutta-percha, the patient was dismissed. At the next sitting the cement had sufficiently hardened to permit the utilization of a clamp and the rubber dam. The three root canals were fully explored, the abscesses finally cured, and the canals filled, all of which was demonstrated by radiographs.

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ANOTHER ADVANTAGE of this method was that after filling the root canals the cement was removed from within the band, to clearly expose all margins of the root circumference, and without displacing the band, it was made to serve as a matrix, and amalgam was packed and anchored so as to build up the root properly for the reception of the final gold band. Moreover, as summer was approaching the patient was dismissed with the band still in place, and it served as a temporary crown for four months, by which time all disease had been exterminated. Thus was this almost hopeless condition treated and a healthy, firm abutment for bridgework saved for the patient.

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SUBSEQUENTLY a variation of this proceedure was thought of. A patient presented with a well-fitting gold crown on a lower first molar. This had been made by one of that class of dentists already described, who just hates to hurt a patient. He, therefore, had placed this crown over a living pulp, which had died, causing an abscess. This crown was removed without slitting the band. A hole was drilled in the side near the cusps of the crown, which hole was enlarged sufficiently to receive the end of a stout instrument, which, used as a lever, readily pried off the crown, thus preserving the band intact. This band was thoroughly cleansed, the cusp portion cut away, the edges made smooth, and then after cleansing all old cement from the tooth root, this band was cemented to place, and utilized for simplifying the application of the dam, as in the last case.

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THESE TWO EXPERIENCES have established another and more frequently useful technique in my practice. Very often we have root canal work to undertake in teeth, where an approximal cavity has burrowed below the gum margin to such an extent, and the mouth is so moist, that it seems next to impossible to exclude the mouth fluids with the dam. And yet we know that an absolutely dry field is necessary to aseptic operation. In such cases I wedge the teeth apart on the un-

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affected side of the tooth, to obtain ready access for the fitting of a band. Then with the thinnest of platinoid, which I now prefer to German silver, I make a soldered band which passes below the gum an engages the cavity margin at the carious aspect. This band should be nicely burnished to the walls of the tooth, and when cemented to place should be further stoned and polished so as to be acceptable to the tongue, because occasionally treatment may cover a prolonged period.

THIS METHOD not only permits a perfectly aseptic root operation, but if the band be well made and fitted, the gum septum between the teeth will recover much more rapidly, than where gutta-percha is packed against it continually as in the usual methods. Moreover, when the time for filling arrives, and the band is removed, the gum at the cervix will stand away sufficiently so that a perfect wax pattern for an inlay can be obtained, in which the imprint of the cervical margin will be sharply distinct.

THIS SUBJECT of the application of the rubber dam is far from exhausted in this brief monologue. But one needs the inspiration of a catechiser. Perhaps some of you, who have troubles of your own in connection with the dam, will dine with me some day and talk it over. Or if you are too busy to run over to New York next week, just write me a description of a case where it is "impossible to apply the rubber dam," and I will get a few bright chaps to sit with me, and we will talk it over "Around the Table."

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Dr. Charles A. Meeker.

Resolutions on the Death of Dr. Charles A. Meeker, D.D.S., Ex-Secretary of the New Jersey State Board of Registration and Examination in Dentistry.

WHEREAS, In the providence of an All-wise Creator, our fellow-member, Dr. Charles A. Meeker, died September 8, 1913; and

WHEREAS, His indefatigable industry, his record as an examiner, his skill as an organizer and systematic developer of the New Jersey State Board work for a period of time covering twenty years, have combined to place him without a peer among eminent examiners;

Now, Therefore, Be It Resolved, That we, the members of the New Jersey State Board of Registration and Examination in Dentistry, deeply deplore his loss, and express our great appreciation of his long and intelligent services; and be it further

Resolved, That a page of our Minute Book be inscribed with these resolutions and a copy of the same be sent to his bereaved widow and to the professional journals for publication.

HERBERT S. SUTPHEN, D.D.S., President.
ALPHONSO IRWIN D.D.S., Secretary.
WILLIAM E. TRUEX, D.D.S.
VERNON D. ROOD, D.D.S.
CORNELIUS KIEL, D.D.S.
CHAS. P. TUTTLE, D.D.S.

Dr. George Washington Cook.

WHEREAS, The Odontological Society of Chicago is once more called upon to record the death of one of its most eminent members, Dr. George Washington Cook, who died on December 21, 1913; and

WHEREAS, The members of this Society in meeting assembled, fully realizing that a link of inestimable friendship has been suddenly snapped in the affairs of Society relationship; and

WHEREAS, the Odontological Society in the expression of bereavement must fully recognize that the life of Dr. Cook was one of love and

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unceasing devotion to scientific investigation. His numerous contributions to dental literature especially evidenced the mental activity of a well-trained mind.

Therefore, Be It Resolved, That these resolutions be spread upon the records of this Society and that a copy be sent to the family of the deceased and a copy be sent to the various dental journals for publication.

J. E. HINKINS,
J. G. REID.

John Nathan Crouse, D.D.S.

Born September 15, 1842—Died January 16, 1914.

Dr. Crouse was born near Downington, Chester County, Pa. Early education in village schools of Pennsylvania and Illinois; then in Mt. Carroll (Ill.) Seminary, 1859-62. Received D.D.S. degree at Pennsylvania Dental College, Philadelphia, 1867. Began practice of dentistry in Mt. Carroll, Ill., 1864, and since 1868 has been in practice in Chicago. Last surviving charter member of Illinois State Dental Society. Founded Dental Protective Association and was its President until December, 1913. Member of National Dental Association, Chicago Dental Society, Calumet Club. Leaves a widow and son (Dean).

Dr. E. V. Shadomy.

Dr. E. V. Shadomy, at his home at 2079 Albion Street, Denver, Col., February 4, 1914.

Ds. Shadomy was born at Queensville, Ind., on July 30, 1867, and was a graduate of the Class of '02 of the Colorado College of Dental Surgery, as well as a member of its Faculty. He leaves a wife and one child.

The following resolutions were passed at the regular monthly meeting of the Board of Directors of the Colorado College of Dental Surgery, February 5, 1914:

Resolved, That we, the Board of Directors of the Colorado College of Dental Surgery, feeling deeply the loss we have sustained in the death of Dr. E. V. Shadomy, a graduate of this school and a member of its Faculty, do express our great sorrow; and be it further

Resolved, That this memorial be sent to the bereaved family and a copy spread upon the minutes of this Board and one sent to the dental journals for publication.

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National Society Meetings.

American Institute of Dental Teachers, Ann Arbor, Mich., January 28-30, 1915.

National Dental Association, Rochester, N. Y., July 7, 8, 9, 10, 1914.

American Society of Orthodontists, Toronto, Can., July 2, 3, 4, 1914.

Panama-Pacific Dental Congress, San Francisco, Calif., 1915.

Canadian Dental Association, Winnipeg, Manitoba, May 26, 27, 28, 29, 1914.

Secretary, Dr. M. H. Garvin, 314 Somerset Blk., Winnipeg, Manitoba, Canada.

State Society Meetings.

Arkansas State Dental Society, Little Rock, Ark.

Secretary, Dr. C. L. Hunt, Fort Smith, Ark.

California State Dental Association and Southern California Dental Association, Yosemite Valley, Cal., June 29-30, July 1-2, 1914.

Secretary, Dr. E. E. Evans, Union Savings Bank Bldg., Oakland, Cal.

Colorado State Dental Society, Manitou, Colo., June 18-20, 1914.

Secretary, Dr. E. W. Spencer, 120 Pope Block, Peblo, Colo.

Connecticut State Dental Association, Hartford, Conn., April 21-23, 1914.

Secretary, Dr. Arthur V. Prentis, New London, Conn.

Florida State Dental Society.

Secretary, Dr. Alice P. Butler, Gainesville, Fla.

Georgia State Dental Society, Atlanta, Ga., June 4-6, 1914.

Secretary, Dr. M. M. Forbes, Candler Bldg., Atlanta, Ga.

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ILLINOIS STATE DENTAL SOCIETY, Chicago, Ill., March 23-26, 1914.
Secretary, Dr. Henry L. Whipple, Quincy, Ill.

INDIANA STATE DENTAL ASSOCIATION, Indianapolis, Ind., May 19-21, 1914.
Secretary, Dr. Otto U. King, Huntington, Ind.

KENTUCKY STATE DENTAL ASSOCIATION, Louisville, Ky., March 9-12, 1914.
Secretary, Dr. Chas. R. Shacklette, Atherton Bldg., Louisville, Ky.

MAINE DENTAL SOCIETY, Augusta, Me., June 25-27, 1914.
Secretary, Dr. I. E. Pendleton, Lewiston, Me.

MARYLAND STATE DENTAL SOCIETY.
Secretary, Dr. F. W. Drew, 701 N. Howard St., Baltimore, Md.

MASSACHUSETTS DENTAL SOCIETY, Boston, Mass., May 7-9, 1914.
Secretary, Dr. A. H. St. C. Chase, Everett, Mass.

MICHIGAN STATE DENTAL SOCIETY, Detroit, Mich., April 9-11, 1914.
Secretary, Dr. F. Ward Howlett, Jackson, Mich.

MINNESOTA STATE DENTAL ASSOCIATION, Duluth, Minn., August 6-8, 1914.
Secretary, Dr. Benjamin Sandy, Syndicate Bldg., Minneapolis, Minn.

MISSOURI STATE DENTAL ASSOCIATION, St. Louis, Mo., April 21-22, 1914.
Secretary, Dr. S. C. A. Rubey, Warrensburg, Mo.

MISSISSIPPI DENTAL ASSOCIATION, Vicksburg, Miss., June 23-25, 1914.
Secretary, Dr. M. B. Varnado, Osyka, Miss.

MONTANA STATE DENTAL SOCIETY, Great Falls, Montana, June, 1914.
Secretary, Dr. F. W. Adams, 14-15 Chicago Block, Billings, Montana.

NEBRASKA STATE DENTAL SOCIETY, Lincoln, Neb., May 19-21, 1914.
Secretary, Dr. H. J. Porter, Cambridge, Neb.

NEW HAMPSHIRE STATE DENTAL SOCIETY, Weirs, N. H., June 17-19, 1914.
Secretary, Dr. Louis I. Moulton, Concord, N. H.

NEW JERSEY STATE DENTAL SOCIETY, Ocean Grove, N. J., July 15-18, 1914.
Secretary, Dr. John C. Forsyth, 430 E. State St., Trenton, N. J.

NEW YORK STATE DENTAL SOCIETY, Albany, N. Y., May 14-16, 1914.
Secretary, Dr. A. P. Burkhart, 52 Genesee St., Auburn, N. Y.

NORTH CAROLINA DENTAL SOCIETY, Hendersonville, N. C., June 24-27, 1914.
Secretary, Dr. J. Martin Fleming, Raleigh, N. C.

OHIO STATE DENTAL SOCIETY, Columbus, O., December 1-3, 1914.
Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

OKLAHOMA STATE DENTAL ASSOCIATION, Oklahoma City, Okla., March 30-April 4, 1914.
Secretary, Dr. C. R. Laurence, Enid, Okla.

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PENNSYLVANIA STATE DENTAL SOCIETY, Phila., Pa., June 30, July 1-2, 1914.
Secretary, Dr. Luther M. Weaver, Phila., Pa.

TENNESSEE STATE DENTAL ASSOCIATION, Chattanooga, Tenn., June 4-6, 1914.
Secretary, Dr. C. O. Rhea, 625½ Church St., Nashville, Tenn.

TEXAS STATE DENTAL ASSOCIATION, Fort Worth, Texas, April 13-17, 1914.
Secretary, Dr. J. G. Fife, Dallas, Texas.

UTAH STATE DENTAL SOCIETY, Logan, Utah, June 19-20, 1914.
Secretary, Dr. I. P. Stewart, 1st Nat. Bank Bldg., Logan, Utah.

VERMONT STATE DENTAL SOCIETY, Rutland, Vt., May 21-23, 1914.
Secretary, Dr. P. M. Williams, Rutland, Vt.

WEST VIRGINIA STATE DENTAL SOCIETY, Huntington, W. Va., August 12-14, 1914.
Secretary, Dr. A. C. Plant, 802 Schmulbach Bldg., Wheeling, W. Va.

WISCONSIN STATE DENTAL SOCIETY, Fond-du-Lac, Wis., July 14-16, 1914.
Secretary, Dr. O. G. Krause, Wells Bldg., Milwaukee, Wis.

International Dental Congress—Special Notice to Reporters.

I quote herewith from the Sixth International Dental Congress rules, *i. e.*:

"Article 18—Reports. In each section a time will be reserved for the discussion of important questions, which have previously been selected by the council of the section, with due regard to the International character of the congress. Each discussion will be introduced by one or more reporters chosen by the council of the section. The manuscript of these reports must be typewritten and must be sent to the office of the congress before April 15th, in order that they may be printed and distributed as soon as possible to all members of the congress who have then been enrolled. The reports will not be read in extenso in the section. Each reporter will be allowed a maximum of 15 minutes for an open resume and 10 minutes for a reply at the end of the discussion. Other speakers taking part in the discussion will be allowed a maximum of five minutes only for their remarks."

Typewritten reports should be addressed to the offices of the congress as follows:

The Hon. General Secretaries,
Sixth International Dental Congress,
19, Hanover Square, London, W.

Will you kindly comply with their request and send your typewritten report to them by April 15th, and oblige,

Sincerely,
BURTON LEE THORPE, Secretary.

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Complimentary Dinner to Professor Faneuil D. Weisse.

A complimentary dinner to Faneuil D. Weisse, M.D., will be tendered by his friends in the medical and dental professions, to commemorate his completion of fifty years as practitioner and teacher, at the Hotel Astor, Forty-fifth Street and Broadway, Saturday evening, March 28, 1914, at 7 o'clock.

Those desiring to attend will kindly communicate with the secretary at as early a date as possible.

COMMITTEE.

W. W. WALKER, Chairman,
58 West Fiftieth Street, New York City.
HENRY SAGE DUNNING, Secretary,
17 East Thirty-eighth Street, New York City.
J. W. TAYLOR, Treasurer,
106 East Fifty-seventh Street, New York City.
H. W. Gillett, A. R. Starr, A. L. Swift, R. Ottolengui, W. B. Dunning, E. Hillyer, H. P. Gould, C. B. Palmer, F. W. Van Saun.

Examination of Dentists for U. S. Army.

The Surgeon General of the Army announces that examinations for the appointment of Acting Dental Surgeons will be held at Fort Slocum, New York; Columbus Barracks, Ohio; Jefferson Barracks, Missouri; Fort Logan, Colorado, and Fort McDowell, California, on Monday, April 13, 1914.

Application blanks and full information concerning these examinations can be procured by addressing the "Surgeon General, U. S. Army, Washington, D. C."

The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between 21 and 27 years of age, a graduate of a dental school legally authorized to confer the degree of D.D.S., and shall be of good moral character and habits.

Acting Dental Surgeons are employed under a three-years' contract, at the rate of $150 per month. They are entitled to traveling allowances in obeying their first order, in changing stations, and in returning to their homes at termination of service. They also have the privilege of purchasing certain supplies at the Army commissary. After three years' service, if found qualified they are promoted to the grade of dental surgeon with the rank of first lieutenant, and receive thereafter the pay and allowances appertaining to that rank.

In order to perfect all necessary arrangements for the examination, applications must be in the possession of the Surgeon General at least

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two weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There are at present 28 vacancies to be filled.

Connecticut State Dental Association.

The Fiftieth Anniversary Meeting of the Connecticut State Dental Association, with Dr. James McManus, of Hartford, the President, will be held in Hartford April 21, 22 and 23, 1914.

Every committee in charge is doing its utmost to make this one of the finest meetings ever held in New England.

The papers will be by Dr. C. N. Johnson, of Chicago; Dr. Charles R. Turner, of Philadelphia; Dr. W. A. White and Dr. Darlington, of New York, and Dr. W. H. Fitzgerald, of Hartford.

The clinics, while not many, are being selected with great care, and only men who have something to show will be there.

The exhibits will surpass anything ever given in Connecticut. A cordial invitation is extended to all ethical men out of the State to be present and learn and enjoy some of the good things with us.

ARTHUR V. PRENTIS, Secretary.

New London, Conn.

Annual Registration in Indiana, Including Licensees Living in Other States.

The registration of the dentists under the new Indiana law is well under way. The new law calls for the annual registration of all dentists who have ever been registered in Indiana, whether they are practicing in the State or not, if they wish to retain the right to practice at any future time.

Section 9 provides as the penalty for failure to renew within a period of three months after December 31st of each year the cancellation of said license. Provided, that any license thus cancelled may be restored by the board upon payment of a fee of $5, if paid within one year after such cancellation. There is no provision for the restoration of a license thus cancelled after a period of one year.

Dentists thus eligible to register should immediately send for application blanks to

F. R. HENSHAW, Secretary and Treasurer.

507-8 Pythian Bldg., Indianapolis, Ind.

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American Institute of Dental Teachers.

At the annual meeting of the Institute of Dental Pedagogics, held at Buffalo, January 27, 28 and 29, 1914, the name of the organization was changed to American Institute of Dental Teachers. The following officers were elected for the ensuing year: President, Fred W. Gethro, Chicago, Ill.; Vice-President, H. M. Seman, Columbus, Ohio; Secretary-Treasurer, John F. Biddle, 517 Arch Street, N. S., Pittsburgh, Pa.; Executive Board, Shirley W. Bowles, Washington, D. C.; A. W. Thornton, Montreal, Canada; R. W. Bunting, Ann Arbor, Michigan.

The next annual meeting will be held at Ann Arbor, Michigan, January 28, 29 and 30, 1915.

J. F. BIDDLE, Secretary.

Chicago Dental Society.

At the annual meeting of the Chicago Dental Society, held December 16, 1913, the following officers were elected for the ensuing year: President, T. L. Grisamore; Vice-President, F. B. Moorehead; Secretary, P. B. D. Idler; Treasurer, R. E. MacBoyle; Librarian, E. D. Coolidge; two members of the Board of Directors, J. P. Buckley and G. C. Poundstone; Board of Censors, T. A. Broadbent, L. H. Arnold and Ashley M. Hewett.

T. L. GRISAMORE, Secretary.

Meeting and Post-graduated Course of the Oklahoma State Dental Association.

The next meeting and third annual post-graduate course of the Oklahoma State Dental Association will be held in Oklahoma City, March 30-April 4, 1914. Drs. Jos. B. Eby and Thos. P. Hinman, of Atlanta, Ga., are to be the lecturers.

An important feature of the course will be a progressive clinic, conducted two afternoons of the week by noted clinicians from out of the State.

C. R. LAURENCE, Secretary.

Enid, Okla.

Lake Erie Dental Association.

The Fifty-first Annual Meeting of the Lake Erie Dental Association will be held May 21, 22 and 23, 1914, at Hotel Bartlett, Cambridge Springs, Pa.

DR. C. L. MEAD, Secretary.

Union City, Pa.

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Restoring an Efficient Articulation by Carving.

By Frederick W. Frahm, Ph.G., D.D.S.

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I was in the senior year of my college course when it appealed to me that amalgam fillings ought to be carved in such a manner as would restore the teeth to their natural forms and functions.

When I was doing the required technic work, I tried to follow out in a measure the lines of the fissures and planes. At that time it must have been amusing to the instructors, for I can well remember the smile that greeted my efforts.

Again, after graduation, I made the attempt to bring this idea of making the sulci and restoring the various inclined planes as found in the normal teeth, at one of the Iowa Alumni Society meetings, by giving a clinic on a pet inlay method of mine, in which I restored one of the cusps and all of the sulci and the transverse ridge of an upper molar. As I remember, this inlay was not what I would now want it to be, nor was it by any means what it ought to have been; nevertheless, I was contending for a principle.

While this piece of work was being inspected by the older and

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more able members of the profession, and I was defending the principle, one of the men said, "You little upstart, do you not know that all fissures must be finished rounding and never made so deep?"

When the wax pattern method for gold inlays was introduced, I designed and made several forms of carvers, three of which (Fig. 8) I kept for the work, since they seemed to meet my needs better than anything else that I had had or seen. I will describe the technic of their use later.

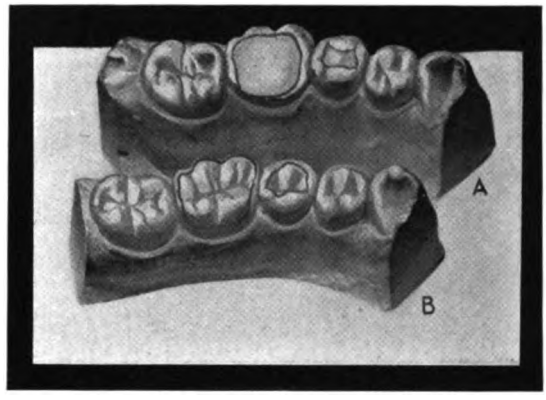


Fig. 1.

I have read with a great deal of interest the paper by Dr. J. Lowe Young on *"Restoration of Occlusion by the Casting Process,"* also the editorials and papers in ITEMS OF INTEREST that have supported the doctrine. I feel that this is just the beginning of a new day in dentistry, both from the dentist's and the patient's standpoint. The gold foil filling is passing, and must pass to give place to more humane methods of operating. It is certainly anything but a longed-for operation on the part of the patient to have an M. O. or D. O. foil filling made in a molar or premolar, to say nothing about the larger restorations. Also the operator would conserve a good deal of his nervous energy, prolong his usefulness by longer life and more years of service, if less foil fillings were made. For the sake of argument, I will grant that an expert gold operator can make a fine M. O. operation in an upper first molar, with perfect margins and a well-condensed body, but what has he accomplished when all has been completed? How much resistance will this filling offer to the force of mastication? Will it flow and thus leave the buccal and lingual margins? And half a dozen other interrogations might be made.

It is an established fact that when we have done our best we have hammered away on that filling until the tooth is so lame the patient

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cannot use it for a week or more with any comfort. Thus we have in a way inflicted an injury to the peridental membrane that may at some future day stare us in the face in the form of gingivitis. It is also a fact that our filling at its best has only a specific gravity of 16 or a little better, and will flow very easily under the force of occlusion, thus driving it from the enamel margins of the approximal portion of the filling.

Have you ever removed an old foil filling of your own, or some one's else, placed it between the beaks of an ordinary contouring pliers and noticed how much this piece of gold can be condensed? Also have you ever taken an inlay, cast after any old process, and treated it the

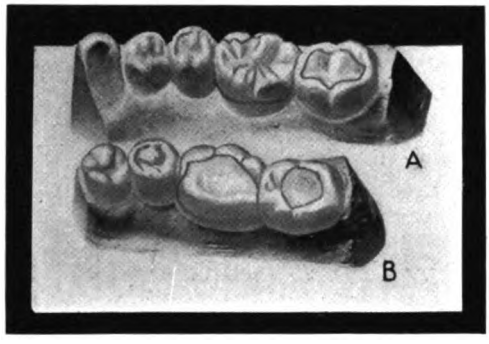


Fig. 2.

same way? If you have, you will have noted what I have observed many times. The inlay offers many times more resistance to this kind of stress than does the foil filling.

By experimental tests it has been found that the specific gravity of cast gold is a little better than 20, but it is well to remember that all metals when cast do not possess the flow that hammered metal does. Especially is this true of alloys, some of which may become quite brittle and refuse entirely to flow; hence an alloy of gold rather than pure gold is to be desired for casting purposes.

Occlusal Surface. Having always had the desire to reproduce the natural occlusal surface in my crowns and bridges, and finding it very difficult or impossible to do so by swaging this surface in 30-gauge metal, I used to swage it out of 34, or, better still, 36-gauge. Then I would make a new die and counter and swage again, thus giving me a sharp reproduction of the carvings. Into this I would swage another piece of 34 or 36-gauge metal and swage them together. This gave me a cap of 17 or 18-gauge thickness, with

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nearly as good a surface as can be obtained by casting. This method was abandoned to a great extent when the casting technic became better known.

Amalgam. Whenever a case was shown where the cusps in a large amalgam filling has been restored, carving in the various inclined planes and having them meet to form a sharp and well-defined sulci, the argument was immediately made, "Amalgam will not withstand such abuse. It was never intended for such contour work. Better make flatter fillings and

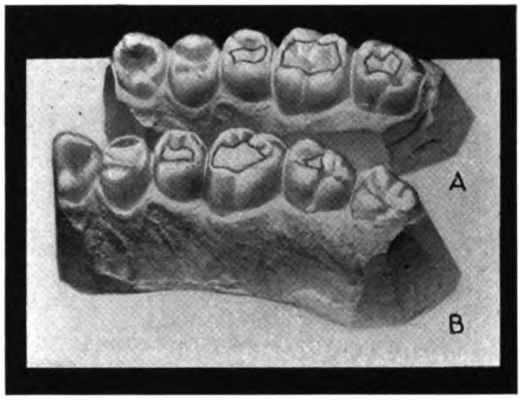


Fig. 8.

of such shape as not to throw any stress upon them during mastication." This argument made me hesitate. One day when I had leisure, a patient happened into the office. She was a poor working woman with two children to support. When asked what I might do for her she asked to have a broken-down upper left second molar extracted. The crown was all decayed as far down as the junction of the middle with the gingival third. It was offending her in that it kept the tongue and cheek irritated. After quite a little talking, she agreed to allow me to restore this tooth with amalgam. This I did, being very careful to carve in all the sulci, bringing out the cusps as prominent as any in her other teeth. I saw this tooth at different times for four years, and found it to be giving perfect satisfaction. Patient's age, over forty years.

In prosthodontia, the operator, when he wishes to do exact and scientific work, desires to know the plane of the mandibular joint, also how prominent the *tuberculum articularis* may be, for this is in part to determine the arrangement of his teeth, the relationship of the cusps and fissures. He would not be doing his best if he ignored these. The man

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working in the operative field must also recognize the influence that this part of the human anatomy has to offer in the way of help or hinderance. Here I wish to make a point that I have never before seen in print. That the slope of the various inclined planes, depths of the sulci and prominence of the cusps is governed by the inclined plane of the articulating surface of the mandibular joint, together with the action of the *discus articularis* in which the condyloid process of the mandible rests. For, should we find upon measurement that this path is at an angle of 15° to the occlusal plane, the sulci will not be deep, nor will we find such prominent and pointed cusps. Should we find this incline plane to be

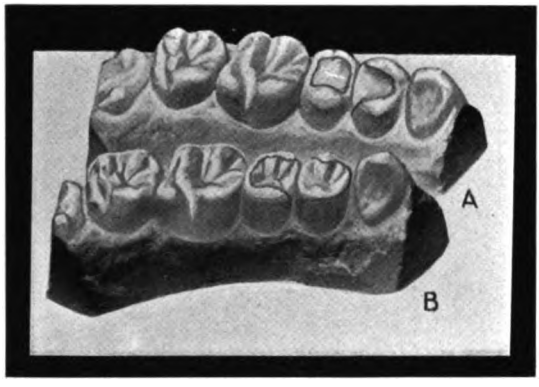


Fig. 4.

50° to the plane of occlusion, we may expect to find very deep sulci with prominent cusps. If the arch and arrangement of the teeth are in relation to the triangle of the mandible, no matter what age the patient may be, twenty-five or sixty-five, the cusps will remain the same, the sulci and inclined planes as deep and sharp as ever. It is only when the normal has been interfered with in any way that we get wear on these teeth at the expense of the cusps. The Almighty knew what He was doing when He made cusps and sulci, and thought they were needed, and, in my opinion, the dentist who intentionally obliterates either is guilty of willful malpractice. His intention of doing that patient a benefit proves in reality an injury. I hope the time will soon come when such mutilation will not be looked upon with indifference by the profession.

Fig. 6 shows three teeth extracted by the author from the jaws of an old man over sixty-five years of age. The teeth were lost by the excessive deposit of salivary calculus. In these you will be able to note that the occlusal surface, though it is worn by long years of use, still has its sharp sulci and planes leading to sharp and well-defined cusps.

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If you could examine the amalgam filling in the distal half of the main sulsus, you would note that the planes terminated in this filling at a sharp angle to each other, due entirely to wear and not the operator.

Articulation.

"Strive only for a good, substantial occluding surface." That sounds well at first, and many seem content to stop at that. Why not get an articulation as well as an occlusion? We may have a perfectly occluding set of teeth that will be as utterly valueless for mastication as so many blocks of flat ivory. We must have articulation, so that when the cusps touch cusps of the opposing arches on the one side, the inclined planes join to form the rectangular groove in which the food is held and crushed when

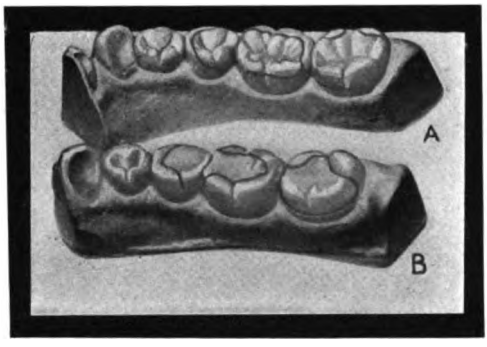


Fig. 5.

these cusps slide down along each respective plane. If the buccal cusps only occlude, this groove will be open on the lingual and the food will slide out without being crushed. If the sulci have been filled up, this groove will be a deal smaller, thus decreasing its efficiency; also when the opposing cusp is sliding down the inclined plane it does not need a flat opposing surface, but slides off on that rounded area occupied by the filling thus reducing the efficiency. In either case we have good occlusion, but no articulation. Many times the statement has been made, "The bottom of the grooves when normal are never reached by the cusps of the teeth of the opposing jaw." I know full well that some very able and eminent men hold this view and that it is so stated in text books of the day, yet I maintain that if the teeth are in normal articulation (by which I mean that they must bear correct relation to the type and size of arch required, for the type and size of triangle as shown by the mandible) the opposing cusps always find the bottom of the sulci and the inclined planes will wear upon each other, leaving them to form sharp angles for the bottoms of sulci. (See Fig. 6.) These teeth

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were worn for over fifty years. In this collection you may see an old amalgam filling in the lower second molar, where the wear cut a sulcus in the amalgam. I could cite many cases to prove the statement.

Cases From Practice.

Fig. 1. Here I wish to call your attention to a large amalgam restoration (?) in the lower first molar, involving the entire occlusal and lingual. It is evident from the illustration that the operator had a fear that his work would not endure unless he made a toboggan toward the lingual. In the bicuspid will be seen a very common pit and fissure filling; in fact, both of these operations are of the usual kind. I think it needless to say

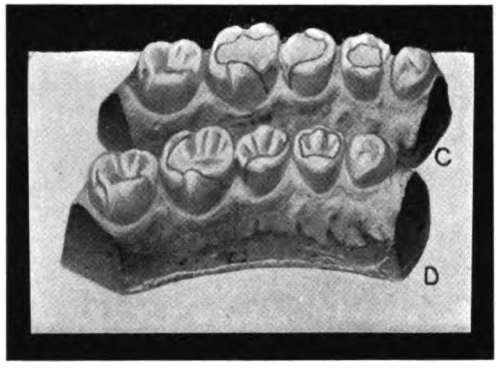


Fig. 5.

more than that these teeth, especially the first molar, are 50 per cent. or more below normal of efficiency. Fig. 1, B, restored with amalgam, is far more efficient, to say nothing about being more artistic.*

*Because of the difficulty of photographing plastic casts on which inlays are colored, we have here tried using an outline in pencil.—Ed.

Fig. 2. This shows an amalgam filling in a lower first molar and a small filling in the second molar. These two operations were made by a very thorough operator; he had restored the lingual wall, building what makes fair lingual resistance to the lingual surface of the upper teeth. The patient did not complain about the work, simply stating that somehow he had difficulty in chewing on that side. The fact is, food cannot be comminuted by "grinders" that have been mutilated by caries and not restored by the operator to their once useful surface shape. Contrast Fig. 2, A, and Fig. 2, B. In my humble opinion, the last cast shows teeth that will thoroughly comminute the food.

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Fig. 3. This shows two foil fillings, one in the second molar and another in the second premolar. Neither one is large enough to give much offense. The first molar contains a very large occlusal cast inlay. These three operations were made by an "old-timer." It is this kind of work that makes patients complain about their teeth feeling as though they were made of rubber. In this case (a young man of twenty-three) we could see the evidence of incipient gingivitis around this first molar and the mate on the other side, it having a similar inlay. From study of such cases, I

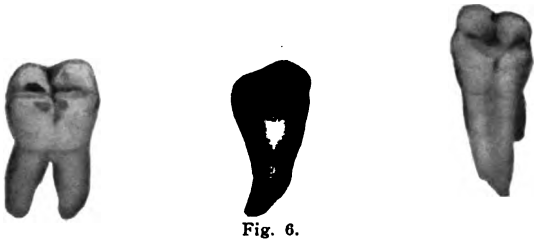


Fig. 6.

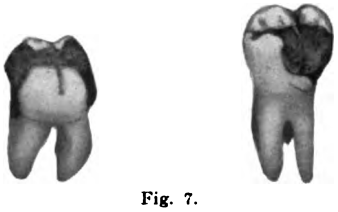


Fig. 7.

firmly believe that many cases of pyorrhea can be traced to a mutilation of the occlusal surface. Fig. 3, B, shows the case properly restored.

Fig. 4. A cast of a young man in which the two premolars have been operated upon. A disto-occlusal cast gold inlay in the first premolar, and a foil filling in the occlusal surface of the second premolar. Both of these operations were made by recent graduates from one of America's leading dental colleges. The mouth shows beautiful natural teeth, with pits, fissures and ridges well defined. We took out the two fillings and restored these two teeth to their normal, as seen in Fig. 4, B, with cast gold inlays.

While operating for a young lady several years ago I restored the two lower first molars to their former usefulness with two large mesio-occlusal cast gold inlays. Some one had placed a shell crown over each tooth. Fortunately for us, the teeth had never been ground. When the inlays were in position and finished, the patient was admiring them and remarked, "Why, Doctor, those fillings have wrinkles in them, just like

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my other teeth." It is safe to say that the average person fully appreciates an artistic piece of work.

In a study of the cases shown in the illustrations I think it needless for me to state that these teeth were not performing their function and that their efficiency had been greatly impaired, if not entirely destroyed. For where the rectangular groove cannot be made and food caught within its bounds, so that it may be held and crushed, real mastication cannot take place.

Fig. 5. Fig. 5 shows a case in which both the upper and lower molars and premolars now contain large restorations made in amalgam. The illustration shows before and after treatment. The upper second molar will give some idea as to what the teeth looked like before they were decayed and then restored (?) to their usefulness. These fillings, viewing them from whatever point you may desire, were anything but what they should have been, judged from the point of workmanship, usefulness, mouth hygiene and science. The interproximal spaces had been sadly neglected and the contact, instead of a point, was a surface that took in one-third to one-half of the tooth, but the principal thing I want to call attention to is the beautifully polished and flattened occlusal surfaces. This patient, instead of having received benefit aside from the arrest of decay, had received untold injury. In thus obliterating all the sulci, the bite had been raised on both sides. The patient was uncomfortably conscious that something was not right, for the pleasure of mastication had become hard work, the reason of which is self-evident. Could anything be done to restore this masticating apparatus to its former usefulness? By viewing the work shown in Fig. 5, cast B and D, you will see what has been done far more effectively than words can tell. I am sorry you cannot see the plaster casts and still more sorry that you cannot see the patient.

I could multiply these cases many times, as each man who is practicing operative dentistry can, but I feel that it is not necessary. It simply would be drawing too much upon your time.

Stress During Mastication. What stress must the occlusal surface of a tooth in the ordinary individual withstand? I shall not try to answer it definitely, since it is a disputed point, the answers ranging from 150 to 400 pounds crushing pressure. In some cases this amount has been exceeded even to a point as high as 600 pounds but under ordinary conditions of mastication it is reasonable to presume that the stress a filling will have to withstand will range from 200 to 300 pounds. Since a good amalgam will withstand a pressure of from 300 to 450 pounds, when the technic

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of preparing the amalgam and of making the filling has been observed, we need not fear for the strength of the filling, even after it has been carved to the proper articulation. Gold, of course, is beyond this question, since it will withstand more pressure than amalgam.

Technic of the Amalgam Restoration.

Always observe the articulation before beginning the operation. After the rubber dam is in position and the cavity has been properly prepared, the matrix should be cut and fitted to place, then securely fastened to allow the proper condensation. I always overfill somewhat, working the excess mercury, if any, to the surface. While the filling material is beginning to harden, I immediately proceed with the carving, using the three instruments shown in Fig. 8. The two, right and left, are used for cutting the sulci from buccal to lingual, and can be used to some extent in working in the main mesio-distal sulcus, though I prefer to use the one where the blade sets at right angle to the shank of the instrument. The cutting edges of the blades set at an angle of 90° to each other for ordinary purposes, I have another set where the angle is somewhat more acute, 80°, which I use for teeth that have very deep sulci. The blades are wide enough and their edges long enough to cover the distance from the one margin to the other and still rest on the tooth, thus insuring a clean margin to the filling.

For example, let us consider a lower first molar. Cut in the mesio-buccal sulcus to the central fossa first, then the lingual. From here the operator may proceed mesially or distally; I prefer to cut the mesial half of the main sulcus next, then lastly the disto-buccal and distal sulci. The lower second molars in Figs. 2, B, and 5, B, show the main sulci worked in without the supplemental sulci. These main sulci should be carved first. If you have carefully noted the articulation beforehand, you will not need to fear that the filling is too high. Of course, if one or more cusps have to be restored, I remove the dam and finish carving the filling to the proper articulation by occasionally trying it with the opposing teeth. This procedure will give a nicely burnished surface to the amalgam, but should you desire to give it a lustre, you may do so by the use of chalk and a hand wood-point polisher. A polisher revolving in the engine hand-piece is not to be used, though a careful use of a soft-brush point may help. But unless it is very carefully used, damage to the amalgam filling will be done.

The technic of carving the wax pattern for the gold inlay is the same as for the amalgam, with this caution: Do not use any heat on the instruments and use a good quality of hard wax, for then the surface and sulci will come out bright and sharp. Then, by going over it with cotton soaked in cadjiput oil, and vesting in good investment, the inlay

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will come out in such fine shape that a wood point with pumace and chalk in a hand-polisher will give it a desirable finish.

As soon as it is perfected, I will offer to the profession an instrument that will be found ideal and rapid for this kind of work, also for prophylactic work. I am sorry that I cannot show it here in connection with this article.

In conclusion, it has frequently come to me in the form of an argument, "Gold fillings are not desirable" because patients complain

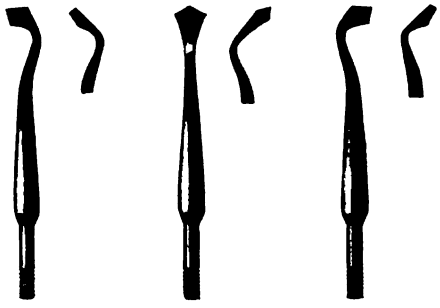


Fig. 8.

of a sensation as though they were chewing on rubber, and the food gives away under the stress of mastication.

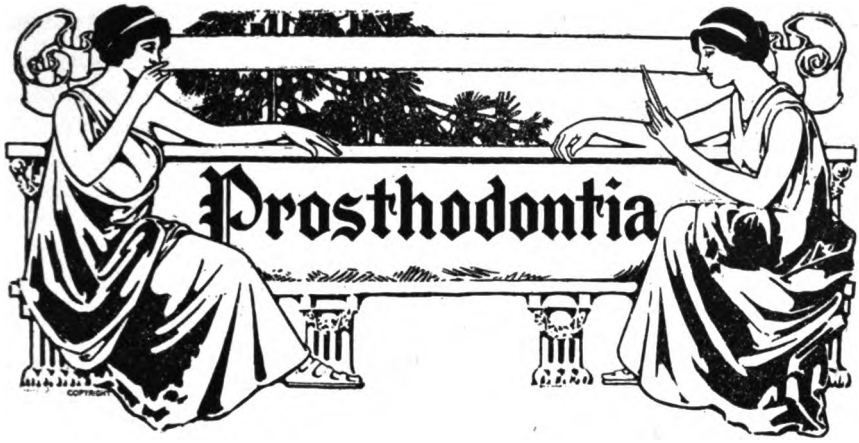
Viewing the situation as it has existed to the present, and bids fair to exist for some time to come, we will agree with the above argument against gold. What may we expect from an articulation that has been crippled by the partial, if not entire, obliteration of the rectangular groove? I have noticed that, after the correct form of the occlusal surfaces of the teeth had been restored, even to the extent of a four-tooth posterior bridge, no such criticism as the above was offered.

Compare with me the three teeth shown in Fig. 6, which show very distinctly the sharp sulci and perfect inclined planes, even after fifty-five years' wear in the mouth of a tobacco-chewer, with the two teeth shown in Fig. 8, which were recently extracted by a member of the profession while I was administering the anesthetic. These teeth show amalgam fillings made by two good men in Denver, Col. I did not choose these two teeth because of the conspicuous work done in them, for they represent fairly well the average, no matter from what viewpoint the operation may be considered. The illustrations of some of the casts shown bears out the point also.

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I believe that nearly 70 to 80 per cent. of the so-called pyorrhea alveolaris is due to faulty operative and prosthetic procedure, and from this percentage from 40 to 50 per cent. of all the mechanical causes may be traced to an obliteration of the cusps, sulci and inclined planes, which are an absolute necessity. If it was not so, the Almighty and Wise Heavenly Father would not have created the human masticatory apparatus as we find it in all its beauty, before decay and the hand of dentistry has touched it.

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Positive Method of Repairing Facings on Cuspid Bridgework in the Mouth.

By Bertram B. Machat, D.D.S., New York.

To the many triumphs accredited to the casting system in dentistry, the most inexhaustible fountain from which modern dentistry is drawing the secrets that already have solved so many problems in its practice, must be added also the practical solution of restoring posterior fractured facings on cusped bridgework in the mouth.

Without exception, nothing has proved a greater cause of chagrin to the patient, and material loss as well as vexation to the dentist, than the fracture of a facing on a well-constructed and properly mounted bridge. Ofttimes the operation of restoring this proves too difficult and expensive to be practical. The patient thus goes about discrediting the dentist and the profession.

Various methods have been devised to remedy this evil, but with limited success. That is to say, limited to anterior or uncusped teeth only, as the Bryant system, the Stede repair outfit, etc.

The introduction of several varieties of interchangable teeth and their gain of popularity with dentists has been the direct outcome of disappointments and the incalculable loss of the independable flat-back or plate tooth.

We will not here enter into the numerous causes that are responsible for the fracturing of plate teeth or facings, either during or after operating. Suffice it to say, that it is a condition that presents too fre-

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quently to be ignored, and we must therefore cope with this problem in a manner thoroughly operative instead of as heretofore, speculative.

The method which I am about to introduce is not of yesterday, but the product of nearly three years of experiment and experience, during which time it has been found almost universally applicable for all posterior cusped bridgework, and I desire to characterize this the "Machat Method."

After grinding the space to be restored flat, we take a suitable right angle bur and cut a vertical groove or slot in the body of the bridge to a depth (bucco lingually) consistent with the thickness of the same, and

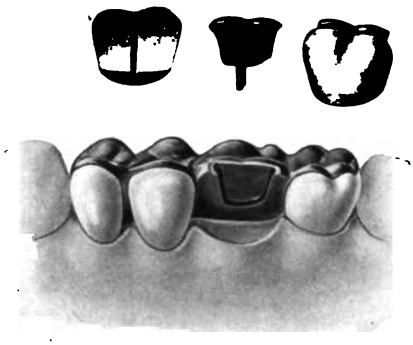


Fig. 1.

width not exceeding about two-thirds of the whole space to be restored. The slot is cut so that it has parallel vertical undercuts at the anterior and posterior extremities, and may preferably be so prepared as to be very slightly broader at the morsal end (Fig. 1).

A suitable Steele tooth is now selected, and together with its backing ground in to fit the case as desired; several small holes are punched in the backing and replaced upon the tooth. It may be simpler to take, instead of the backing, what is known as a Steele Post (sold at dental depots), and place that within the facing and grind in together. A little inlay wax is now melted on the lingual surface of the backing or post and facing and pressed home into the already prepared groove in the bridge, taking care that the wax covers the entire surface and also overlaps upon the occlusal surface slightly. The Steele facing may now be removed and the surplus wax carved so as to leave none overhanging or wedging, after which the facing is again replaced; a sprue warmed and applied to the morsal end of the wax pattern and the latter with the facing is carefully removed from the slot. The facing is now peeled off and the wax pattern with the backing or post thereon mounted upon a sprue former and cast, prefera-

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bly with clasp metal gold. The finished casting is replaced in the bridge, the tooth mounted and the whole properly trimmed and polished, after which it is cemented to place. Wherever indicated after the slot has been prepared, a wax mould representing the tooth and plug *en masse* may be carved and cast and mounted.

Summary. This method of repairing posterior facings on cusped bridgework in the mouth is thus found to be: Simple in technique; universally applicable; permanent; clean; requires inconsiderable time by the operator; above all, is a means of encouraging aesthetic work, and thereby eliminating the unsightly "gold tip."

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American Society of Orthodontists.

Discussion of Dr. Federspiel's Paper.

Dr. Martin Dewey, Kansas City, Mo.

Yesterday I made the statement that six months is long enough to retain teeth if we have the proper development of bone, but since listening to Dr. Federspiel's paper, and the wondrous things which he claims the pituitary body causes, I have decided to give extract of pituitary body and retain the teeth only six days. But laying all joking aside, there is no doubt but that certain diseases of the pituitary body does cause abnormal development of the bone, and that the removal of the body experimentally produces characteristic results. However, I believe that very few of the malocclusions which we find, in fact, I believe none that I have ever seen are the result of diseases of the pituitary body. Dr. Federspiel showed several cases which had been diagnosed as pathological conditions of the pituitary, and one thing which I could not help but notice is that there were other deformities besides those found in the mandible. Therefore, I do not believe that in those cases in which we find an overdevelopment of the mandible, that we can lay such a condition to the pituitary body; for if it has produced overdevelopment of the mandible, there would be overdevelopment of some of the other bones. He also called attention to a paper which he read several years ago and seems to think that some cases of malocclusion are caused by overgrowth of the mandible, but I believe that there is little evidence to support that point of view. I believe that the overdevelopments of the mandible which Dr. Federspiel showed, in the extreme cases of those young men, had been the result of the malocclusion of the teeth, which

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produced abnormal forces that caused the mandible to become overdeveloped. In other words, the overdeveloped mandible is the result of the malocclusion and not the cause of malocclusion.

In regard to the relation which the temporo-mandibular articulation plays in malocclusion, my studies of cases and skulls lead me to believe that in the majority of class II and III cases, or distal relation and



Fig. 1.

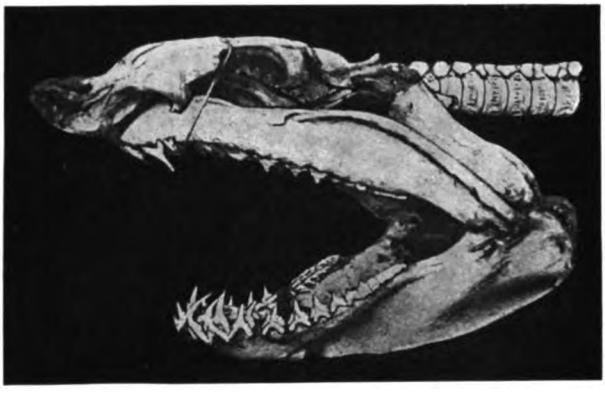


Fig. 2. Shark.

mesial relation of the lower teeth, that the condyle occupies the same mesio-distal relation that it does in normal occlusion. There may be a few mesial relations which have been the result of partial luxation, but they are rare, compared to the class III cases in which the condyle occupies its proper position. I do not believe that the condyle is of the same shape in all individuals, nor that it travels in the same plane in all cases, for one would learn otherwise who examined a few skulls or measured the paths of a few condyles. The reasons for this difference in shape and difference in paths lays in the occlusion of the teeth. The

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teeth have been the factors which have caused the condyles of different people and animals to assume different shapes. In a paper I read before the National Dental Association at Denver upon "The Relation of the Cusp, Contact Point, and Temporo-mandibular Articulation," I made the statement that the development of the temporo-mandibular articulation depends upon the occlusion of the teeth. That the depth and shape of the glenoid fossa with the shape of the condyle depends upon the length



Fig. 8. Crocodile.

of the cusp, and that the width of the condyle depends upon the width of the teeth.

I will not give you that entire paper, but as Dr. Federspiel took up the development of the temporo-mandibular articulation, I will only speak of that phase of the subject and show you how occlusion has effected changes in some cases.

Beginning with comparative dental anatomy, for we find the same rules working there that work in man; I will show you the skull of a rattle-snake (Fig. 1). The teeth are conical, with a highly developed poison apparatus and shaped for prehension and deglutition. The temporo-mandibular articulation is shaped to allow the animal to swallow large objects; there is no occlusion of individual teeth, yet the shape of the teeth and the function to which they are put causes the loose articulation of the bones of the lower jaw with the cranium.

Next we have the jaws of a shark (Fig. 2). The teeth are not so long, the food is not swallowed in such large "chunks," but there is no occlusion of individual teeth. The condyle and glenoid fossa is poorly

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developed and is very much the same as is found in any of the higher animals. If you pass to the higher reptiles you find a greater development of the temporo-mandibular articulation as the functions of the teeth increase. An interesting example is found in the alligators and their cousins (Fig. 3), for in them conditions have been such as have caused the glenoid fossa to develop on the ramus and the condyle on the temporal bone. Owing to the short legs of the animal and the long



Fig. 4. Foetal Horse.

jaws, the mandible is so close to the ground that it is impossible for the animal to open the mouth except by moving the entire head.

In the mammals, the condyle develops as the teeth erupt and come into use, and as they are lost, the temporo-mandibular articulation changes. A good example of this is shown in a series of horse skulls which are in the American Museum of Natural History, in New York. I will show you but three. Fig. 4 shows the skull of a male foetal horse at the fifth or sixth month of foetal life. The teeth have not played any part in the development of the temporo-mandibular articulation, which is shaped as all such parts are; as the result of years of development in the animal kingdom. The condyle which we find here is very much the same as we would find in a foetus of a carnivora before birth. It is very much the same as is found in the human, which I will show you later. The point I wish to make here is that the condyle in any family of mammals does not take the shape characteristic of the adult animal until the teeth erupt. Fig. 5 shows an adult horse in which the condyle is typical of those animals. In the old horse (Fig. 6) the teeth are being worn down and with the loss of occlusion the condyle is changing.

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Another species of animal which has a decided use for the teeth is the beaver. A beaver (Fig. 7) without teeth would soon be no beaver at all. The life of the animal depends upon the teeth. In fact, that is true of most of the lower animals, yet we find people who think man does not need any teeth. But this is not a lecture on oral hygiene. We



Fig. 5. Horse; age 5 years.



Fig. 6. Horse; age 27 years.

observe that the condyle of the beaver is round, the glenoid fossa is lengthened antero-posteriorally, and the ligaments are so attached that the mandible can be protruded so as to bring the incisors together, which teeth do not touch when the molars are in occlusion. So the temporo-mandibular articulation is greatly modified, for the teeth perform a function which they are called upon to perform only in those animals with the scalpiform incisors. The shape of the condyle is characteristic of

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animals which do a great amount of gnawing with the incisors. I have a skull of an old person, who lost all of the molars and premolars and masticated on the anterior teeth and the condyle assumed the same shape as is found in the beaver. Instead of being wider bucco-lingually it is wide mesio-distally.



Fig. 7. Beaver.



Fig. 8. Kangaroo.

In the kangaroo (Fig. 8) we have a lateral movement of the mandible instead of the antero-posterior movement as seen in the beaver. The difference in the condyle is easily seen.

Passing to the mountain lion (Fig. 9) we find a deep glenoid fossa and a narrow condyle antero-posteriorly The greatest diameter of the molars and premolars is mesio-distally and the greatest diameter of the condyle is bucco-lingually. This rule holds true in all animals; the

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greater diameter of the condyle will be the reverse of the greater diameter of the molars and premolars (Fig. 10). The occlusal view of the mountain lion shows this. The long canines make an up-and-down movement of the mandible necessary and the condyle and glenoid fossa has assumed a shape to make that possible.

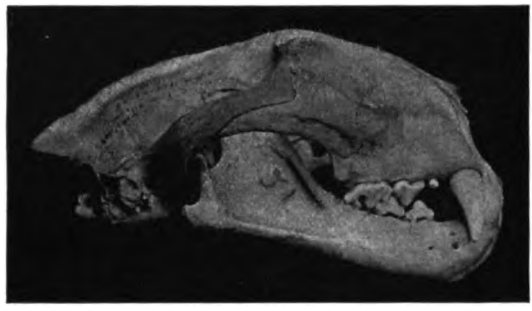


Fig. 9. Mountain Lion.



Fig. 10. Mountain Lion.

In Fig. 11 we see the teeth of a rattle-snake; decidedly conical teeth, in which the whole dental apparatus is one that is highly specialized so far as the poisoning apparatus is concerned, and the temporo-mandibular articulation is developed for prehension. We see nothing in the nature of a distant condyle.

The effect of the teeth on the temporo-mandibular articulation in animals closely related, is shown by comparing the wild hog of Mexico (Fig. 12) with the domestic hog (Fig. 13). These animals greatly resemble each other, but the long canines which still develop in the wild

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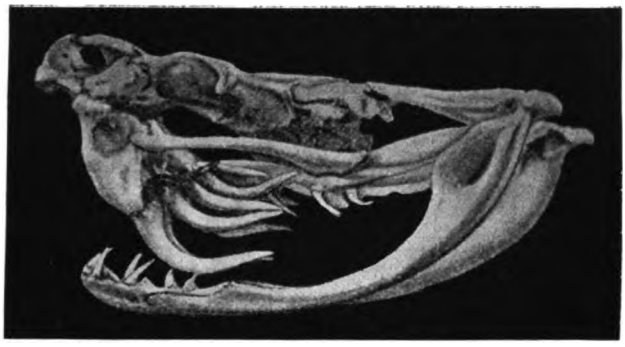


Fig. 11. Rattlesnake.



Fig. 12. Wild Hog.



Fig. 14. Cave Tiger.



Fig. 13. Domestic Hog.

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hog as a means of defense, have caused the temporo-mandibular articulation to greatly resemble the carnivorous animals. The domestic hog having been removed for the necessity of protecting himself, has his food provided for him; the canines have ceased to develop as organs of defense and the condyle resembles an herbiverous animal. These changes have been the result of the different development of the teeth.

The extent to which the development of a tooth may influence the development of the bones necessary to its function, is shown in the cave-tiger (Fig. 14), an extinct animal of North America. The great length



Fig. 15.

of the canine made it necessary for the entire temporo-mandibular articulation to change, and the mechanical stimulation of the great upper tooth caused the bone to develop on the mandible to support the tooth.

In man the temporo-mandibular articulation changes in response to the same influences as it does in the lower animals. It is made up of a number of parts which must be taken into consideration when discussing any changes that may occur. Besides the condyle and glenoid fossa, we have the external capsular ligament which is a white inelastic ligament which envelops the entire articulation. It spreads around the glenoid fossa and is attached at the neck of the condyle. There is the stylo-hyoid ligament and the spheno-mandibular ligament which are also white inelastic ligaments which run from the styloid process and the spine of the sphenoid to the mandible. These ligaments are of such a nature that they do not change as rapidly as the bone. Fig. 15 shows the anatomy of the temporo-mandibular ligament dissected out and is a cut taken from Piersol's anatomy, as is the cut showing the styloid process and ligament. Owing to the extreme inelasticity of the ligaments of this joint, any change that occurs in the bones must occur without disturbing the attachments or length of the ligaments.

The condyle in man does not assume a definite shape until after the teeth are in occlusion as shown in Fig. 16. The final shape of the articulation depends upon the occlusion of the teeth. If all the teeth

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are present and in normal occlusion we will have a mastication apparatus and articulation as shown in Fig. 17. Fig. 18 shows a mandible which has different shaped condyles on the two sides. Owing to a malocclusion, the individual masticated only on one side. Fig. 19 shows three condyles, all of which have different shapes, owing to the different man-



Fig. 16.



Fig. 17.

ner in which the owners of them masticated. These changes which occurred in the condyles were such as could occur without the ligaments changing.

If you will look at Fig. 17 and note the position of the condyle in relation to the external auditory meatus, the styloid process and the mastoid process, you will have a good idea of what those parts are when normal. The next skull is one from Dr. Cryer's collection and shows what may be considered a normal relation of the parts (Fig. 20). It was necessary for the individual to masticate only on one side, with the result that the condyle changed in shape, but not in position. There was absorption of

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the eminentia articularis as well of the condyle; but in addition to those changes there was a building of bone on the posterior end (Fig. 21), which gives about the same relation of the posterior end of the condyle to the styloid process and external auditory meatus as was seen on the other side. On the abnormal side there was a shortening of the neck



Fig. 18.

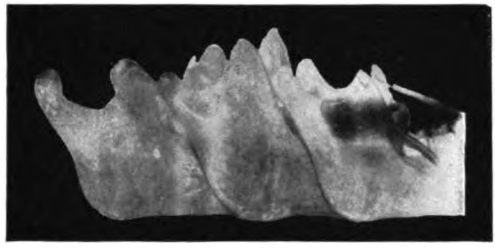


Fig. 19.

of condyle which would be necessary as the ligaments would not stretch. The changes which are produced by the occlusion of the teeth are similar to those produced by malocclusion.

I have stated that I do not believe that the condyle changes position in Classes II and III. There has been little evidence given to prove anything either way. However, there is a skull (Fig. 22) in which we have a decided case of malocclusion. The lower teeth are distal to the upper, but the condyle occupies the same position as is found in the skull (Fig. 17) with normal occlusion. The ramus is short and the body of the mandible is underdeveloped. The abnormal condition exists in the mandible below the external capsular ligament. In a Class III case, all of the lower teeth are in mesial relation to the upper (Fig. 23). The mandible is overdeveloped because of the malocclusion of the teeth. The condyle occupied the same position as we find in the normal skull and in the skull with the class II case. While it takes more than two or three skulls to prove anything, I believe that a great deal of knowledge can be gained if we can examine a number of skulls which are known to

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have the mandible with them that nature put there. Therefore, in closing, let me state my position again. I believe that the shape of the condyle and the development of the mandible depends upon the occlusion of the teeth. Also that the position of the condyle has little to do with the distal or mesial relation of the teeth. Furthermore, that the lack of development of the mandible and the overdevelopment of the mandible



Fig. 20.

occurs at points below the external capsular ligament. And lastly, to prove anything in regard to the changes which occur in Classes II and III cases, a large number of skulls must be studied and something given besides theories.

Frederick C. Kemple, New York City.

Dr. Federspiel has shown a series of interesting pictures, beginning with apparently normal individuals. The next picture showed these same persons to be slightly deformed, the next one worse, and the next one still worse, until they were horribly deformed. He showed pictures of several cases of progressive deformity and says, "this is simply the effect of the condition of the pituitary body"; they were all produced through some abnormal condition of this organ. I would like Dr. Federspiel to tell us how he knows that these conditions are entirely produced by pathologic conditions of the pituitary body. I have had the impression for a long time that the function of the pituitary body was somewhat mysterious. I did not know that its function had been satisfactorily established.

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Dr. Fischer, St. Louis.

I regret very much that I have not had a chance to study this paper, because it is a subject in which I am very much interested. It is a continuation of the argument which the essayist presented in his paper at Boston, wherein he accepted the terms I suggested for certain types of malocclusion, and analyzed the basis that I offered for these terms,



Fig. 21.

viz.: malposition of the teeth, malrelation of the dental arches, and malformation of the jaws. To these he would add *malposition of the mandible.* That appealed to me at that time and does now, and ever since then I have been observing patients more carefully when I make a diagnosis. I will admit that at times it is rather difficult to say whether a case is a distoclusion, or whether it is a mandibular retroversion; a mesioclusion, or a mandibular anteversion. These conditions may, it seems to me, blend by imperceptible gradations. As I said yesterday: whether we like it or not, it is our duty to work out the morbid anatomy of every type of dento-facial deformity. We must extend our observations beyond the study of occlusion and malocclusion as shown by plaster casts and by mere photographs of patients. It is our duty to make observations beyond that and to include the study of skulls of human beings in whom these typical oral deformities exist.

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I believe Dr. Federspiel has undertaken a very important and fundamental work, and I urge him to continue it. I can conceive of no valid reason why jaws may not be abnormal in development, or growth; why a mandible may not be malposed in its relation to the other structures of the face. And if this is possible, as I confidently believe it is, it is of greatest significance to orthodontists.



Fig. 22.



Fig. 23.

Dr. Kemple.

I found two rather interesting skulls in the Wister Institute of Anatomy, at Philadelphia, a few years ago. In one of the mandibles the third molar was erupting partly back of the anterior border of the ramus. Looking at the mandible in profile, only about one-third of the third molar showed

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in front of the ramus. In the other mandible all of the third molar showed in front of the anterior border of the ramus. In these two mandibles the one that showed the whole of the third molar in front of the ramus seemed to be well developed and the one that showed only one-third of the third molar was an undeveloped mandible. The strange thing about these conditions is that the one that was an undeveloped mandible was a Class III when articulated with the skull, and the one I thought was a well-developed mandible was a Class II when articulated with the skull. There are stranger things in orthodontia than are dreamed of in our philosophy.

Dr. Ottolengui. Were these mandibles attached to the proper skulls?

Dr. Kemple. I think they were.

Dr. Federspiel. (Closing the discussion): Dr. Kemple asked a question regarding the pituitary body. I would suggest that Dr. Kemple look up and study the work of Dr. Cushing. He has been observing the action of the pituitary body. The point that I want to bring out is that we have to look further than an inclined plane when we wish to make a diagnosis of malocclusion and dento-facial deformities.

I am glad Dr. Dewey discussed the subject, but notwithstanding that my work is experimental, I am satisfied that the temporo-mandibular articulation is subject to variations in shape and position during the period of tooth eruption. It is a difficult matter to obtain specimens of the temporo-mandibular articulation. I had a splendid case I would like to have shown, but it was taken away from me by the parents of the child. It was a typical mandibular retroversion, the glenoid fossa was large and shallow.

In order to obtain a better understanding of the development of the temporo-mandibular articulation in its relation to malocclusion it is necessary to make a large number of dissections in children. Comparing the same to cases wherein the relation of the teeth are normal as well as the adjacent structures.

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The Use, Dangers and Limitations of Nitrous Oxide and Oxygen.

By Henry B. Clark, D.D.S., St. Paul, Minn.

This paper with slight changes has been read at the Winnipeg, Man., Dental Society, The Southern Minnesota and South Dakota State Societies, and before the Alumni Association of the Xi Psi Phi Fraternity of the Twin Cities.

The use of nitrous-oxide is, of course, old, but as the methods employed at present are comparatively new, a little as to the possibilities and probabilities of the newer methods may help some beginners in this branch of our work. The person who does one thing only, naturally learns more of that one thing than the one who does that thing only occasionally, and I have presumed to come here and read this paper in the hope that I may be able to tell you something of this one thing which I do, which may interest and serve you.

I shall assume that you are familiar with the history of anesthesia and only refer to that as it may have a bearing upon the methods in use at present. I think I am right in assuming also that those of you who are interested in gas anesthesia have the newer apparatus with oxygen tanks and nasal inhaler, and that you think you have safer anesthesia than you had with the old outfit for giving straight nitrous-oxide, which you have up to a certain point.

I want to remind you, however, that where nitrous-oxide has made its enviable record for safety, and I might add lack of after-effects, is where it has been given with all air excluded, or by whatever method so that the anesthetic has been discontinued when operating commenced. You may push nitrous-oxide almost to the limit, if you then discontinue it and begin extracting teeth. The reflex stimulation resulting from operating will enable the patient to throw off the effect quickly if given

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a chance, but if it is pushed too far and continued without sufficient oxygen you soon arrive on dangerous ground.

Until quite recent times but few men have used the newer methods, and these have been mostly men who by constant effort and practice have become very expert. Properly given in correct proportions, I cannot but feel it to be *absolutely safe;* in fact, it has so proven itself.

It is the *incorrect administration,* coupled with a lack of realization of danger, which we must avoid. Many of the older men, even at present, continue in the old way with straight gas and face inhaler, and it is this work and these methods that have so often been referred to as the *record* of gas—as to to its safety. I *do not* advocate that the old methods be continued; quite the contrary. I constantly use and advocate the use of the newer ones, but I wish you to realize that one should proceed with some caution in the beginning with these newer methods; to warn you against accepting as gospel all you hear about gas from inexperienced men. I want to emphasize that an element of danger is present when anesthesia is maintained for any considerable length of time, which danger does not exist when a patient is only brought to complete anesthesia and immediately allowed to recover. I am, of course, referring to gas anesthesia. When straight gas anesthesia is used the patient is not ready for operating until a more or less pronounced snoring is heard and twitching of the muscles of the extremities and sometimes of the neck is seen, a sort of short, jerky movement all over. If everything is working right this condition may usually be produced, a tooth or teeth extracted, and the patient be conscious again in the short space of two minutes. I feel sure, many, many times failures are due to beginning to operate before the patient is asleep.

Precautions. In using the nasal inhaler for operations in the mouth, one may get the patient to sleep with the face inhaler with the mouth prop in place, then begin operating and have an assistant continue with the nasal apparatus; or, if he begins with the nasal inhaler, it is well not to place the prop until the patient is partially anesthetized. If the prop is not placed until the patient is partially anesthetized, it is well to tell him you are going to place it after he is partly asleep, or he may become excited when you do so, thinking you are going to begin operating when you place the prop. It is also well to hold something over the mouth until nasal breathing is established, or even until anesthesia is produced.

Apparatus. It is not necessary to buy a new gas and oxygen apparatus every time a new one is placed on the market. One can get good results with almost any sort of apparatus if he knows how, and if the apparatus lacks some

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essential points, with the application of a little ingenuity and the assistance of a mechanic the operator can alter it to meet the requirements of a successful one. One essential is a large, free passage for the gas in the tubing and valves leading to the inhaler. One well-known apparatus was never a success until recently, and now is one of the best ones to be had, because, while the tubing was large and every effort was used to make it a success, where the tubing connected to the inhaler the opening was too small. The manufacturer not being a practical anesthetist, or an anesthetist at all, except for the fact that he is an enthusiast regarding gas and oxygen, spent many thousands before this simple defect was overcome. Another essential is the exclusion of air, not only around the rim of the inhaler, but in the exhaling valve; the little disk which rises when the patient exhales and seats when he inhales must seat perfectly. This is a weak point in most of the outfits. If the edge catches and it does not close so as to prevent air entering when the patient inhales, use your ingenuity and fix it so that it does, or you will not have success. The exhaling valve, especially in the nasal inhaler, must be constructed so that it can be closed and locked, so as to make a perfectly tight little cup of the inhaler, so that the gas can be forced through the nose by pressure from the cylinder as occasion requires. If this cannot be done, again it is necessary to change things so that it can be if results are to be obtained.

Preparations Before Extracting.

I wish to mention here a few points in the operation of extracting teeth outside anesthesia. First, have the gas apparatus ready for use, then plan the case and have the instruments arranged in the order they will be used. If you sterilize by boiling, as everyone should, I feel that it is permissible to cool the instruments in tap water. I mention this because I think many do not boil extracting forceps, because it takes so long to cool them; and I am sure many when extracting under anesthesia go from a pussy root to the not apparently infected, but will admit this is careless, and it would be better to change instruments after removing an infected tooth. A little precaution, which gives me considerable satisfaction, and will please you if you use it, is to paint around each root and flood the cavities of the teeth to be extracted with tincture iodine, as a means of preventing infection when extracting. Some surgeons rely almost entirely upon idoine for sterilizing skin surfaces before making incisions, and I think it is a very good practice to use it as indicated.

Mouth Opening Gags.

A good mouth-opening gag and tongue forceps should always be at hand, as in case of obstructed breathing from any cause. The first thing to do is to open the mouth and draw the tongue forward.

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The mouth-opening gag is also of service when a child refuses to take the anesthetic and parents insist that it be given. The child may be put to sleep and the mouth quickly opened afterwards if he refuses to tolerate a mouth prop at the beginning. Then in case a patient drops the mouth prop after he is anesthetized, if one has not a good mouth opener which can be inserted between the teeth it may be necessary to allow the patient to awaken to get the prop placed again, and this is somewhat humiliating to the operator. I also have a prop which, while not a mouth opener, may be inserted when all uppers or all lowers or both on one side have been removed, leaving the operator free to work on the other side. You all know how hard it usually is to place a prop where it rests against gums from which the teeth have just been removed, and I am sure it will be worth your while to look at this prop if you are not already using something like it. The idea is to put an ordinary prop on the right side, extract on the left, then insert this on the left while operating on the right.

Use of Sponges.

Something often neglected by dentists is sponging. A surgeon requires all blood removed as fast as it comes when he operates, and no person can extract well if the roots are hidden by blood. Therefore, have plenty of sponges. Just a few yards of cheese cloth cut into pieces the size of a sheet of writing paper and get some nurse to show you how to fold it; then either keep in a glass jar and put in a few drops of formalin once in a while, or sterilize in steam. These sponges, or preferably larger ones, or two or three fastened together, may be placed in the back part of the mouth to prevent blood or pieces of root from getting into the throat. They must be large enough, however, so that they will not get into the throat themselves, and used in this way will help anesthesia by preventing air from entering the lungs via the mouth. A small amount of blood swallowed will almost always produce nausea and blood clots quickly form, which if drawn into the air passages may prove dangerous. Therefore, in extracting under gas and oxygen anesthesia it is advisable to keep the patient in an upright position.

We aim to get the patients to assume an ordinary comfortable sitting position and do not allow them to strain the neck by tilting the chin either up or down, as this narrows and constricts the air passages and hinders a free and easy inhalation of the gases.

Method of Administering Gas Oxygen.

In using the nasal inhaler one should have an assistant, who should stand back of the chair, and passing the right hand directly over the head gently, but firmly, hold the inhaler in position while operating the machine with the left hand. This can be

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done without getting in the operator's way at all if done correctly. The gas bag or bags should be just comfortably filled and the inhalation started with pure nitrous oxide, only adding oxygen when anesthesia is almost complete or when the dusky color of the lips or the features or cyanotic breathing indicate the need for it. Watch carefully to see that the inhaler fits closely all around the rim and that the exhaling valve seats properly, so that no air gains entrance, and if there is a tendency to breathe through the mouth this is prevented by holding something—the hand, a piece of rubber dam or a quarter of a large rubber ball—over the mouth. As consciousness begins to be lost, a small proportion of oxygen should be allowed to enter the inhaler, just enough to prevent cyanosis—just enough to keep the color good—too much causes excitement, laughing, talking or crying and delays anesthesia. The signs of anesthesia here are not the same as when giving straight gas. We should not look for the same symptoms. If we get cyanotic breathing and color, we will, if the anesthesia is to be safely continued, be obliged to use so much oxygen to counteract these symptoms that anesthesia is liable to be lost or become so light as to make it impossible to work. So we work up to anesthesia carefully and look for such signs as the arm falling limply when lifted, and the patient not flinching when the eye is touched. This stage may be reached without forcing the gas, or in some cases it may be necessary to force it a little and also to close the exhaling valve, but when the operator begins, the exhaling valve must always be closed and the gas forced more or less, as the case demands, some cases demanding more than others. Now suppose we have our patient asleep and the operating going on, how to keep him so and safe is the problem, and this is how it is done if it is possible, and it is possible with but rare exceptions. Your closed inhaler is held tightly over the nose, and a constant and steady stream of gas is allowed to pour or be forced to the inhaler. This means the gas bag must be well distended all the time after operating is begun. Then we control the patient's condition by regulating the proportion of oxygen given. It is desirable to have a small, steady flow of oxygen which will not require adjustment, but if this is not possible, by watching the patient carefully and with understanding one may range from giving pure oxygen for a breath or two if the breathing becomes labored, to shutting off all oxygen entirely if the patient is coming out, and still obtain a good result.

Assistants.

This, briefly stated, is the way we use gas and oxygen. Now a little about assistants. We are located in a twelve-story building, occupied exclusively by dentists and medical men, and frequently I am asked to go to other offices to give gas. Sometimes if I am out my young lady assistant

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takes care of these calls. Recently she did this for a man who had not called us before, and next day when I saw him he declared that ours was the greatest gas outfit he had ever seen. He said he had bought and thrown away three outfits, but that this one seemed to work! A few days later, he having tried the gas several times during the interval, I met the doctor at lunch. He said, "Say, it is not that outfit; it's that girl." And so I would emphasize the fact that it is not so much what particular apparatus you use; it is the "know-how" back of it. A skillful operator will make a skillful operation in any branch of dentistry regardless of his facilities, while it is pretty true that "the unskilled workman" blames his tools. The question, "Can I use a modern gas machine without an assistant?" is sometimes asked. I should say in answer that one may, but not with as great success or satisfaction as with one. There are but few assistants who will not take a great interest in anesthesia if properly trained and instructed. This interest may be stimulated by getting them to read Dr. Ford's book on anesthesia, and many very good articles are appearing in the journals, and some of the manufacturers of gas outfits keep supplies of reprints which they will gladly furnish to interested parties. One should use his own judgment in reading these articles, as too many are written with two objects, to instruct and also to sell machines.

In training a new assistant I first tell her all I know about gas and oxygen (this does not take long); then I put her to work with no one around to coach, and I do no coaching myself. If I keep telling her what to do she learns to watch me and not the patient. Then I never dare lose sight of the patient, whereas if she learns to watch the patient I can in difficult cases give all my attention at times to the operation. When the case is over and the patient gone I feel free to comment, criticise or praise, and the more praise bestowed, whether entirely deserved or not, the better it is apt to be for me, I think, for if an operation is not successful, and one finds fault, he antagonizes his assistant and spoils the team work. Since I first began this work it has at constantly recurring times reminded me of playing baseball. Little situations frequently arise where one cannot act alone and has not time to express thought, when the only thing that saves the day is that one thing known as "team work."

Extravagant Claims Made for Gas Oxygen.

I think there is some false prophesying going on in regard to gas and oxygen. Somewhat too extravagant claims are being made for it in some respects, and while I think dentists can use gas and oxygen to great advantage in their practices, and while an enthusiast myself, I cannot refrain from stating that it is my

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belief that extravagant claims and overenthusiasm if persisted in is going to cause the extensive use of gas and oxygen to be short lived. Anything for which more is claimed than should be claimed will produce disappointment, and when it is found that some of the claims and assertions made are not true or are exaggerated, there is likely to be a revulsion of feeling that will cause careful men to condemn the method.

Prolonged Administration.

In operative dentistry it may often be used to advantage, but when men advocate working for an hour or more with a patient under an anesthetic, they are, to my notion, advocating a dangerous practice, regardless of what the anesthetic may be. Hewitt, who is considered a standard authority on gas, considers it is the least dangerous anesthetic agent, and says that in fourteen thousand cases "he has had no anxiety," but if one looks into a report of his cases and reads his book he will find that Hewitt does not mention the use of a nasal inhaler for work within the mouth, and altogether the methods employed by him differ from those mostly used and advocated hereabouts at present. Please do not get the idea that I am trying to discredit the method; the point I wish to make is, that when you think of Hewitt as an authority you must remember that his methods are not the same as the one we are now considering, and consequently a comparison does not mean much.

In the administering of gas I often find that patients express a dread and a fear of taking it. This is very foolish of them, for we have often been told, in fact, I have a very recent paper which was sent to every dentist in the United States, which states that N_2O and O is the only anesthetic which has not produced some deaths. This article refers very glibly to operations of from one to five hours under anesthesia in such a way as to infer that to the elect this is a simple matter, and while it is a good article in regard to analgesia, when its author refers to anesthesia he gets a little wild, as I shall show.

Along the line of long administrations, let us look into a report of Dr. Teter's cases. Dr. Teter has done more than all others combined to put gas and oxygen where it is to-day. The closing of the exhalation valve is his idea, and from this simple thing began the first successful use of the nasal inhaler. He is a genius and a pioneer in the use of nitrous-oxide, and out of his ripe experience he is not making any of these overdrawn assertions that come from some of the men who overnight have proclaimed themselves as authorities on this subject. Here is how Teter's cases run as to length of time: Over three thousand of his cases have been anesthesias of from five to fifteen minutes, and I will venture the assertion that this includes nearly all of his dental cases and some hundreds of his nose and throat cases, and that Teter, who to my mind is the

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best authority we have, on dental uses especially, would never advocate the administration of gas for more than a few minutes without first making proper preparation of the patient—that is, patient without breakfast and with proper hypodermic as for any other general anesthetic; and second, serious enough cause to justify the use of an anesthetic. Over eight hundred and fifty of his cases are said to have been of from fifteen to thirty minutes duration, while only three hundred and forty-six have run over half an hour. And he reports twenty-two cases of over two hours, two cases over three hours, and all of these administration without a single death.

Deaths During Gas Oxygen Anesthesia.

There has recently been a death in an apparently favorable case for a successful operation in a Minneapolis hospital, and nothing but gas and oxygen was used. A case written up in the *Dental Brief*, August, 1912, proved to be a gas-oxygen-ether case, and the gas did not get the blame. Dr. Freeman Allen, of Boston, in February 10, 1912 (*Journal American Medical Association*), says: "The safety of gas and oxygen anesthesia in dentistry and in minor surgery requiring brief administrations is not to be contested. It is undoubtedly very safe, but during the prolonged administrations required in major surgery a patient's respiration and circulation undergo many and marked reflex changes, which makes the administration of gas and oxygen in these cases quite a different proposition." Dr. Allen quotes Dr. Bennett, of New York, referring to him as the leading surgical anesthetist of America at the present time: "The writer has administered gas with air or oxygen for operations lasting from a few minutes to more than two hours in several hundred cases, and while he has had no deaths, alarming conditions have several times appeared with such rapidity and so little warning that it seems probable that the general adoption of this form of anesthesia would lead to a mortality nearly approximating if not exceeding that of chloroform and ether. This opinion is strengthened by the occurrence of four such deaths in New York City which have come to the writer's notice within a year. It is therefore probable that nitrous-oxide and oxygen is the safest general anesthetic if restricted to momentary administration of the anesthetic as for dentistry. The prolonged administration of the anesthetic is quite a different matter, however, and at the present time there is not sufficient data to warrant conclusions as to its safey."

Again quoting Dr. Allen: "I have several times encountered in my work the alarming state mentioned by Bennett. They occur suddenly and without warning. The patient suddenly becomes livid; the respiration fails, the pupil dilates, and what I consider the most alarming sign of all, the corneal reflex becomes faint or absent."

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Dr. Allen reports a death from nitrous-oxide and oxygen in the following words: "Last year I had a death under nitrous oxide and oxygen. The patient was a profoundly uremic, almost pulseless man, about to be operated upon for decapsulation of the kidney. After four minutes inhalation of the anesthetic and with the oxygen indicator of the Hewitt apparatus pointing to five, the patient died before the incision could be made, clearly an anesthetic death. It may not be pertinent, but may be of interest to know that during ten years of professional anesthetizing I have had but one other death, and that was due to rectal etherization. I know of two deaths and one very alarming accident occurring within two years in Boston in the practice of young doctors administering gas and oxygen in major surgery."

Personally I know of three deaths occuring under under gas oxygen anesthesia, but upon investigation find that in some cases at least some ether had been used with the gas and oxygen. I will, however, cite three cases from my own practice where the "alarming state" referred to above have appeared, and will say that in only one of these cases was any ether used. All these cases were old men, the kind of men who might be expected to have an attack of apoplexy at almost any time; but that makes no difference; a death in a dental office is always a calamity to the owner of the office.

Cases from Practice of the Author.

The first case was a hospital case, and just after the operation commenced the patient apparently died, as the surgeon said, "He is gone," and I think we all thought so. We opened his mouth, pulled out his tongue and started artificial respiration, with no result. We then turned on the oxygen, and holding the face inhaler in position with the exhaling valve closed, forced oxygen into the lungs as they were expanded by the artificial respiration. By keeping this up we finally got the old fellow around, the first sign being a change in color from a blue to a pink shade. As the operation was then finished, using N_2O and O, but plenty of O, I conclude that the near fatal result was due to not using enough oxygen.

The next case was a dental case, and this was almost a repetition of the other, except that as no ether was used (in the first case a slight quantity was used), I assumed for a time that sufficient oxygen was used, but the more I think of it the more I believe that had enough oxygen been used this case would not have been bad. I thought certainly the man was dead, but by artificial respiration and oxygen we resuscitated him. One might think two such cases would make one so careful he would avoid such results, but not long after I got very interested in a very hard extraction, and although the oxygen ran out, kept on relying on air

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at intervals, until finally my patient stopped breathing, and again I had a very bad few minutes. I sent the assistant for oxygen, and alone I started artificial respiration. When the assistant went out, the door locked, and I did not dare leave my patient to open it, so worked alone until he breathed. This gave the assistant time to go down nine floors into the basement and get some oxygen and return and stand pounding on the door for some time, which statement will give you some idea of the seriousness of the case; also what would have happened had I run for a physician and locked myself out. To sum up the reports of these cases I should say that in my own cases I am convinced death would have occurred in each case but for immediate and properly directed steps taken. I feel that gas oxygen is the safest of anesthetics, but that it is the hardest to give correctly, and for that reason is dangerous if used in long cases by inexperienced people.

Pressure Regulator.

A recent addition to the machines is a pressure regulator for each gas with a little gauge indicating the approximate pressure of the gases passing to the inhaler. This undoubtedly makes for greater safety, for I feel that the deaths which have occurred, or at least some of them, have been caused by the fact that, while the oxygen indicator may have been set at a certain point, the oxygen was not coming through. One fault I see in these regulators is that they are too complicated; there are too many things one might forget to do. There is a little outfit made in Minneapolis which regulates the flow effectively, and a glance at the dials, which are very plainly in view, gives accurate knowledge as to whether the gases are coming through, and it is not possible to have gas coming through without oxygen, if the oxygen indicator shows pressure, and the proportion is easily and quite accurately controlled. This sort of arrangement, it seems to me, makes for the greatest safety.

Analgesia.

Such drugs as morphine, choral and the bromides are analgesic agents, and analgesic agents are, therefore, drugs which dull the sensibility to pain, tend to induce sleep, but do not cause loss of consciousness except in overdoses, as, for example, when employed as so-called "knock-out drops." Anesthetics are agents which cause complete loss of consciousness and complete insensibility to pain. Nitrous oxide gas may now be used both as an analgesic agent, producing much the same effect as these analgesic or hypnotic drugs, except that the effect passes as soon as the inhalation is stopped and as an anesthetic. Of late a great deal has been written about mental suggestion connected with analgesia. Here I can see an opportunity for some men to be kept from using it, as some of the articles on this subject would lead one to believe that the dentist who

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would have success with it must be a sort of hypnotist and sleight-of-hand performer. We must admit that a large part of the success of an operation, using analgesia, will depend upon the state of mind of the patient as affected by what he is told by the dentist, but instead of attempting any flimflam, if the dentist first learns how to do the work, and can by his actions and manner show the patient that he does know what he is doing, and will then have a clear and definite understanding with the patient as to what he expects to do for him, and what the patient is expected to do, he will find that will be about all the mental suggestion necessary for sensible patients who are sincere in a desire to obtain some relief from the pangs of necessary operations on the teeth. If a patient is hysterical, unreasoning and unreasonable, the case is decidedly one not for analgesia, unless you can first conquer and subdue the patient.

Again referring to the dangers we may encounter, I would call your attention to the fact that all of the deaths reported have occurred while medical practitioners were giving the anesthetic. I am unable to find a report of a death in the practice of any dentist, either in general practice or specializing in the administration of nitrous-oxide. When I warn you against working too long with a patient under gas, I mean with the patient unconscious, and this does not refer to doing the ordinary operative work, such as cutting cavities, scaling roots, etc., with the patient only taking enough gas to help him to endure the pain and not enough to make him lose consciousness. There may be a danger here, but if so I am not aware of it. I should consider, however, that extracting teeth with a patient in analgesia with sommoform inhaler in place is risky.

A very important factor in the success of a case of analgesia is the position of the patient in the chair. The position must be such that no strain comes on the neck or muscles of the back or abdomen, and so that the saliva instead of running back into the throat goes forward, where it can be largely removed by the saliva ejector. It is well to allow the patient to spit occasionally, and at the same time instruct him to clear the throat. This I have found by personal experience to be a great comfort. I think it removes the dust which gathers from cutting and burring and moistens up the throat, which naturally becomes dry after holding the mouth open for a long time.

In giving gas for analgesia do not exclude all air, but arrange so that air is always being taken with the gas, and oxygen is rarely needed, unless the patient starts to get blue. The most important points are to impress upon the patient that he is not to go to sleep and then make him do as much assisting as possible by breathing hard through the nose when he feels pain, and avoiding the gas when he finds himself going to sleep. Much remains to be said on this phase of the subject, but this

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paper is long as it is, so I will only add that I hope it may suggest a few things not considered by you before and that at the clinic which has been given this morning I hope to have given you a better idea of the manipulation of the apparatus. I hope nothing said may deter any person from using gas and oxygen, for it seems to me no modern office is complete without it. *Any one* with practice, study and experience may become proficient in its use, but I trust that what I have said may help you to realize the dangers and limitations of its use and to determine the safe, conservative and profitable method of its employment in your work.

In closing I would emphasize this point: In using gas oxygen for operations, other than momentary ones, if you would avoid danger, keep your patient's color pink if at all possible; if not possible to keep a pink color, at least do not allow a patient to become blue, or if so, to remain so. If this is strictly adhered to I think we may safely say one will run very little risk indeed of ever having a case show bad symptoms while giving gas and oxygen.

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New Jersey State Dental Society.

Morning Session.

Thursday, July 17, 1913

PRESIDENT THOMPSON: Gentlemen, I take pleasure in introducing to you Dr. A. E. Smith, Cleveland, who will read a paper on the subject, "Scientific Administration of Nitrous Oxid-Oxygen."

(Dr. Smith's paper and the discussion thereon appeared in January and February ITEMS.)

The hour set by the constitution for the election of officers, having arrived, the election then followed, after which the committee on president's address made a report. This report included several lengthy quotations from the president's address, and a number of separate recommendations were made, all of which were discussed at great length. The stenographer's report will be found in the files of the society. The meeting then adjourned.

Evening Session.

At the Thursday evening session Dr. Francis A. Faught read a paper entitled, "The Importance of Blood Pressure and Pulse Observations During Anesthesia," for which see March ITEMS OF INTEREST. This was followed by a most instructive lecture by Dr. G. B. Winter, of St. Louis, dealing with the subject, "Exodontia," a new word presented by the lecturer for the specialty of tooth extraction. Dr. Winter illustrated his talk with a hundred or more lantern slides.

Morning Session.

Friday, July 19, 1913

As the first order of business the president announced that the question of affiliation with the National Dental Association was open for dis-

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cussion. After a full discussion of the general subject the following resolutions were presented by Dr. Harlan and duly adopted.

Resolved, That the New Jersey State Dental Society, in annual convention assembled, expresses its desire and intention to become a constituent society of the National Dental Association—and declares its intention to organize according to the national plan as soon as possible.

Resolved, That all members of the New Jersey State Dental Society, who may desire to join the National Dental Association as individuals (pending the necessary changes in our constitution) shall, as soon as convenient, give their names, and the year's dues of one dollar to our secretary that we may obtain as full a representation in the House of Delegates as possible.

Resolved, That at this meeting we elect one delegate (and an alternate) to the House of Delegates of the National Association, and that the Executive Committee be empowered to elect as many additional delegates and alternates, as we may become entitled to by the voluntary enrolling of our members into the National Association.

Dr. Chas. S. Hardy was then elected delegate to the House of Delegates of the National Dental Association, and Dr. Henry Fowler alternate.

Report of Legislative Committee.

The following recommendations are suggested, and it is hoped will meet with the approval of the society and be passed upon favorably at this session.

That the Legislative Committee be instructed to have bills drawn to be presented at the next session of the New Jersey Legislature, incorporating the following suggestions for reasons that I will explain as I go along.

First, increasing the membership of the State Board of Dental Examiners to eight instead of five, the present number.

Second, that the time for examination be not limited to three days, but extended to a week if deemed advisable by the Board of Examiners.

Third, that the fine for failure to register yearly be increased to twenty-five ($25.00) dollars instead of ten ($10.00) dollars, the present amount.

Fourth, that a yearly registration fee of one ($1.00) dollar be required from every dentist practicing in the State.

Fifth, that the man hiring illegal practitioners be made liable to prosecution as well as the illegal practitioner himself.

Sixth, that the Legislative Committee look into the matter of the publication of the list of registered men with the State Editor, and if it

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is not found possible to have it published by the State Editor, that the secretary be empowered to have it printed for distribution.

This report was fully discussed, and the following resolution thereon was regularly adopted:

Resolved, That these recommendations be adopted by the society and that the Legislative Committee be instructed to work along this line with the co-operation of the State Board of Dental Examiners and see that the bill is properly prepared and presented at the opening of the next session of the Legislature.

It was also resolved that the bill when drawn should be sent to every member of the society.

Report of Committee on Materia Medica.

Your Committee on Materia Medica begs to report as follows:

A number of new medicinal preparations claimed to be applicable in dentistry have been placed on the market.

Some of these have merit, but the great proportion seem to lack novelty and to be well-known medicinal agents presented in new forms, and possibly more convenient or purer combinations, or under new appellations. To some extent alkaloidal medication is supplanting Galenical preparations. Some, again, seem to be older remedies applied to other troubles, or merely revivals of the use of some past method of treatment.

Humanity seems to have a natural belief and tendency to search diligently for some elixir of life, or panacea, for every disease.

A writer in a Western medical journal has recently written as follows:

"The Chinese idea, and that not uncommonly held in America, is that certain drugs have the power to go to certain organs and by the exercise of some mysterious transcendental force drive out any disease that may affect these organs.

"This is the superstition that the patent medicine men appeal to.

"A proportion of enlightened Americans are still, through an unreasoning habit of mind, pretty much on the same level mentally as the 'heathen' at whom we laugh."

Once in a long while some meritorious agent or mixture may be discovered in medicine which is new and remarkable in its therapeutic effects, but when it is remembered that it took all of the 2,500 years since the days of Hippocrates for empirical therapeutics, or the therapeutics of experience, to discover the really good remedies that are now known, the laws of average or proportion would not call for many new and efficacious empirical medicaments in any one year.

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The greatest advances may, therefore, be looked for in the use of biological sera, vaccines or chemico--therapy.

The trend of modern methods of healing is to acquire a knowledge of the pathological conditions present in the case, and then to use medicines whose physiological action is known to suit it. This is known as "Rational Therapeutics," and the use of biological sera, vaccines and chemico-therapeutics is based on it.

In their search for medicinal agents many dentists seem imbued with the idea that there are certain cure-alls or panaceas, which when locally applied as dressings will heal all gingival or root canal troubles. While, undoubtedly, some known agents are palliatives, and give good results, these practitioners seem to fail to grasp the idea that the cause of a very large proportion of the cases they are called to attend is largely a failure or perversion of normal physiological action, or more properly speaking, a local and painful manifestation of some systemic derangement. For instance, it will be found difficult (and occasionally impossible) to properly treat with local applications, the teeth of patients who are anemic, malarial, diabetic, or who suffer from toxin-forming diseases or intestinal fermentations: or, in other words, in any patient having from any cause a low opsonic index and in whom, therefore, the actions of the leucocytes is hampered or paralyzed. It is nature that effects the cure, and nature must be assisted by and demands proper systemic remedies and tonics.

May Dentists Prescribe Internal Remedies?

This may bring us squarely to the question as to whether or not a dentist has, in this State, the right to prescribe medically at all, or at least for such systemic derangements as interefere with proper treatment in oral or dental trouble. The dental laws do not seem to take cognizance of this matter, and it would almost seem that a dentist did not have the right (and some narrow-minded physicians have quesioned it) were it not that a rational view of the fact that the law requires dentists to prove by examination, prior to licensing, their fitness and knowledge of materia medica, which would presuppose that this test was to ascertain their ability to properly prescribe.

Of course, it would probably be impossible to have an intelligent jury convict any dentist in case of prosecution. To avoid any trouble or controversy, would it not be well to have this society work for a legislative enactment or amendment of the law, declaring that a dental surgeon is a doctor of medicine limiting his practice to treatment of the oral cavity and associate parts and that as such he may prescribe, so far as the proper treatment of his specialty requires and demands?

The right of the dentist to prescribe drugs or use medicines is bound

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to arise at some time in some shape, if not actually carried into the courts, and this contingency should be provided against in the State Dental Law. The form used in North Carolina is the best one we know of. It is worded as follows:

North Carolina Law Sub-Section "A."

"A duly licensed dentist under said chapter ninety-five of volume two of the Revisal is a surgeon limiting his practice to diseases of the teeth and such other diseases of the adjacent parts as may be dependent upon or associated with said diseases of the teeth, and who shall have the same right to prescribe drugs or medicines or perform such surgical operations as may be necessary to the proper treatment of the special class of diseases mentioned in this section, as is now enjoyed by registered physicians."

Anesthesia.

In the field of inhalant general anesthetics and analgesics there seems to be an extension of the use of the old rather than any particularly new discoveries. It has been recently claimed that if oil of orange peel is used during ether administration a noticeable abatement of distressing features and effects will result. The practice of preceding ether or chloroform anesthesia by ethyl chloride or nitrous oxide seems to be increasing. The use of a combination of oxygen and nitrous oxide for general anesthesia in surgery and dentistry and for analgesic purposes in dental operations is, thanks to improved apparatus, widely extending. Scopolamin is being more generally used as a hypnotic or general anesthetic in surgical operations and the use of either scopolamin or hyoscyamin in conjunction with morphin hypodermatically for its hypnotic effects, and also prior to general anesthesia by ether or chloroform for the purpose of obtaining a more tranquil anesthesia, is increasing.

For safety in the field of local anesthesia many now replace cocain by preparations such as eucain, stovain, novocain, olypin, etc. A preparation of urea and quinine has also been used to a limited extent; but the persistence of the local anesthesia, in some cases for two or three days, has a tendency to alarm patients. Refrigerants such as ethyl chloride or ether spray are also more widely used for both analgesic and local anesthetic purposes.

In the field of anesthetics, germicides and antiseptic dressings, there is such a plethora of old, reliable and efficient agents that investigation seldom finds anything introduced as new to be at all superior.

Root Fillings.

There seems an endless variety of materials for root canal fillings and dressings. A new method of filling with medicated paraffine wax has lately been advocated; but filling with wax is not essentially new. The main points

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seem to be that the material used can be introduced as far as the root apex, that it should be so bland that in the event of any being forced through, no serious trouble will ensue, and that it will not waste away, disintegrate, shrink or decay. Several old materials seem to fill these requirements.

Treatment of Inflammations.

In agents for the prevention or reduction of inflammation, it is well to remember that serious inflammation is very unlikely and improbable, and prompt response to local medication may generally be looked for, in the case of healthy, robust patients with virile and opsonic blood, which speedily exterminates or renders latent any ordinary amount of pathogenic germs. If a patient is debilitated to a greater or lesser degree from the effects of catarrh, influenza, or other diseases, or in cases where congested bowels may have accumulated a quantity of fermenting material forming toxins which paralyze the defensive forces or depletes the blood of its opsonins, very little may be expected from local applications. The natural and proper general remedies must be used to cause the secretion and expulsion of the noxious materials and consequent elimination of the supply of toxins to the blood. Proper tonics will often also be necessary to restore the debilitated patient. In such cases the exhibition of saline cathartics, or, say, a suitable compound of cascarin, alvin, podophyllin with suitable tonics generally produce or hasten happy results. Sometimes the saline agent may be given in the form of Hunyadi or other waters.

We will very briefly mention the following agents which have been given particular mention recently in dental or medical literature and may probably interest dental practitioners. Not all are new, some being merely a revival of old methods of treatment:

Bismuth Paste. In pyorrhea pockets.

Alypin. A substance closely related to stovaine, and used as a substitute for cocain, used hypodermically in 1 per cent. to 4 per cent. solutions.

Stovaine. A local anesthetic agent.

Novocaine. Much used as a substitute for cocain, and demonstrated at this meeting. Said to have toxicity only of cocain.

Eucaine Beta. Used as cocain substitute.

Quinine and Urea. Used hypodermically for local anesthesia.

Salvarsan, "No. 606." An arsenical preparation asserted to be a specific remedy for syphilis in all its stages, and in spirillum affections such as malaria. A newer but similar

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preparation of Ehrlich's numbered about "914" is now claimed to be more efficacious.

Aspirin. The acetyl derivation of, and acts like, salicylic acid and is used in painful and inflammatory conditions.

Adrenalin. An organo-therapeutic remedy to control hemorrhage. Different manufacturers market it under various names. Also used as a heart stimulant and in local anesthesia to localize the anesthetic.

Hexamethylomine. (Sold as Formin, Urotropine, Aminoform; Cystogen, etc.) A very useful agent which in its elimination acts as an antiseptic not only in the urine, but in the mucous membrane of the upper respiratory passages.

Kefir Fungi. A mixture of bacteria and yeasts used to ferment milk and form lactic acid therein. Used for intestinal troubles by replacing virulent or putrefactive germs by more benign ones.

Bulgare Tablets. Given directly for the same purpose in doses of one or two tablets before or after meals.

Calendula Tincture. A wash for wounds.

Wax (Medicated). In root canal fillings.

Hydronaphthol. An efficient antiseptic.

Ethyl Chlorid. A refrigerant to densensitise dentin and as a general anesthetic.

Chloretone. A dental analgesic or obtundent.

Dentalone. Chloretone mixed with the oil of cloves, gaultheria and cassia, and used as an obtundent of hypersensitive dentine.

Iodine. A dressing for wounds or before and after operations, a revival of a practice of forty years ago.

Kaolin. A dressing for swellings or wounds. Sometimes medicated. This is also a revival.

Ethyl Alcohol. A dressing for wounds is also being revived, also as injection in facial neuralgia and in cancer. Also used as an antiseptic, particularly when tannin is added.

Ethyl Alcohol and Acetone. A dressing for wounds.

Acetone. An application after operation.

Magnesium Sulphate. Used in concentrated or saturated solution as an application in painful inflammatory conditions.

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Scopolamin or Hyoscyamus. Used in conjunction with morphine prior to ether or chloroform to produce a more tranquil anesthesia; and in some cases these are the only agents used. Also given by the mouth as an analgesic.

Calcium Chlorate. Has been used to hasten the coagulation of blood. Also to lessen or prevent the formation of exudates in inflammatory conditions.

Ether. Has been reported to have been successfully used intravenously (using, say, 250 c.c. of a 5 per cent. solution in normal saline) for anesthesia in weak individuals. As only a small amount is used it is quickly eliminated by the lungs. The patient is anesthetized in ten minutes. The usual by-effects of anesthesia are avoided.

Hydrochloric Acid. Given in doses of fifteen to twenty drops of 40 per cent. H. Cl. one-quarter of an hour after every meal, or, say, four times per day, has given good results in pernicious anemia. Taken in slightly smaller and weaker doses for some time it gradually abated uric acid in the blood and was curative of gout and similar diseases.

Strophanthonin. It is well to know that this drug is a very quick heart stimulant and cases are reported where 1/200 of a grain strengthened the pulse five or ten minutes after the dose was given.

Silver Nitrate. Used in strong solution in roots of badly broken down deciduous teeth, having crowns partially ground off, in order to preserve them and thus retain space for permanent teeth.

Vaccine Treatment and Thytacogens. For pyorrhea, rheumatism and other diseases from mixed infections.

Dental Analgesia. Has been well discussed at this meeting and it is not necessary, therefore, to add more.

Potassium Oleate. For the relief of abscessed conditions, especially soreness after extractions.

Zn. Chlorate Mouth Washes. In the proportion of Zn. Chlor. 1 per cent. with alcohol and essential oils.

Coagulose. A preparation to hasten regulation in case of hemorrhage.

(Signed) THOMAS J. MCLERNON,
Chairman Materia Medica Committee.

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Clinics Before the New Jersey State Dental Society.

Oral Surgery.
Dr. H. S. Dunning,
New York, N. Y.

Case 1. Young woman, age 20, suffering from pain and discomfort on left side of face and upper jaw, region of second bicuspid and first molar. The above teeth were found to be devitilized and at their apices was found an area of necrosis about the size of a ten-cent piece. The necrotic area was directly over ends of teeth and extended to floor of antrum, and was disclosed by a radiograph.

Teatment indicated was the amputation of the two apices involved, and thorough curetage of necrotic area leading to antrum. Patient was given nitrous oxid and oxygen by Dr. Perkins. Incision made about one inch long extending from first bicuspid to second molar; soft tissues including periosteum, carefully laid back and bone exposed. Small pus cavity found surrounded by soft diseased bone. Cavity curetted and packed with gauze incorporated with bismuth paste. Owing to difficulty in operating at clinic, the operator thought it best not to amputate roots this time. At subsequent operation, the first molar was extracted and second bicuspid root amputated. Antrum opened through first molar alveolus, and thoroughly drained, found to contain large amount of foul smelling pus. Wound packed and antrum irrigated daily with warm saline solution. Condition improving, but subsequent opening and drainage through nose will probably be performed to hasten faster repair to tissues.

Case 2. Non-erupted bicuspid tooth in an edentulous mouth of patient, aged 54. The patient had been wearing for some years full upper plate. For the

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last few months patient had felt slight pain in palate region, and complained that plate did not fit as well as it had done previously.

Examination of mouth showed that there was a small sinus situated about middle of palate. Upon probing, a hard, smooth surface was felt which indicated presence of tooth.

Under 1 per cent. novocain injection soft tissues were freely laid open and the crown of tooth could barely be seen situated deep in the hard palate. By means of a very thin root forcep tooth was extracted. Cavity irrigated but not packed.

Chloro-Carboline as an Obtundent and also in Pulp Extirpation.
Dr. S. G. Wallace,
Lakewood, N. J.

This new obtundent was demonstrated by Dr. S. G. Wallace, of Lakewood, N. J. For the operation in cavity preparation, a large cavity in a lower third molar, extending through the occlusal and buccal surfaces to the gingival margin, was selected. After removing the débris, the operator almost filled the cavity with a pledget of cotton, saturated with the obtundent. This was allowed to remain about five minutes under slight pressure. The cotton was then removed and cutting continued without any discomfort to the patient until the cavity preparation was complete. The operator stated that frequently it became necessary to drive warm air through the saturated cotton and in some cases it would be advisable to allow the cotton to remain in the cavity for a longer time, depending upon the sensitiveness of the tooth structure.

In the present demonstration, however, the obtundent acted promptly and the cavity was desenitized in a very short time.

In cutting and grinding sensitive tooth structure for bridge abutments and crowns the best results were obtained by dipping the stone or bur in the obtundent and keeping the instrument and tooth structure thoroughly saturated with the liquid while the operation was being performed.

Although no actual demonstration was given, the operator stated that he had painlessly extirpated pulps under pressure with the obtundent in less time and less discomfort to the patient than by any other method or medicaments. This method, as he explained it, was to carefully remove all débris, saturate cotton in the obtundent, place in the cavity under slight pressure for a few minutes. If hypersensitive, use warm air on the cotton. Enlarge the cavity sufficient for exposure of the pulp and to admit a pledget of cotton thoroughly saturated with the obtundent and a ball of unvulcanized rubber sufficient to seal the cavity. After the adjustment of each a steady, gradual increase pressure should be placed

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on the ball by a broad-faced instrument, forcing the obtundent into the pulp until it fails to respond in pain to pressure.

It will be found that the pulp will rapidly absorb the obtundent and desensitization will be complete after a few minutes' pressure.

The method of application is the same where the pulp is not exposed or in a sound tooth to be used for bridge abutments. The tooth should be wrapped with a strip of gauze to retain the obtundent only in this case the application of the obtundent must be repeated from time to time as sensitive dentine is reached, until the pulp is finally exposed.

The operator strongly advocated using a pipette with which to carry the liquid from the bottle to a receptacle in which the pledgets of cotton and instruments could be dipped.

It is also worthy of note that the obtundent is an antiseptic and will not injure the most delicate tissue.

New Inhaler, Mouth Prop and Respirator.
Dr. H. E. Tompkins,
New York City.

Displayed a new inhaler for surgery of the nose and face. It consisted of a flat-curved tube so shaped that when anesthesia was established it could be passed to the back of the mouth into the pharynx, thus holding the tongue forward and keeping the throat clear.

He showed, also, the application of the new De Pass mouth prop, which consists essentially of a moulded bar of soft rubber to be folded upon itself and inserted between the teeth, holding the mouth open and leaving a clear field on the site of operation.

He demonstrated his new "Respirator," an apparatus for resuscitation by artificial respiration. It consists of a foot bellows, tubing, a controlling safety valve and the face mask or throat tube. This demonstration was given by the use of toy balloons, which were filled and emptied as are the lungs. Its operation follows:

A Champetier de Ribes colpeurynter is passed into the esophagus and blown up, tongue is drawn forward as far as possible, mask is strapped on the face, holding the tongue between the mask and chin; by pumping the bellows, air is forced into the lungs until they are full when any excess air is blown into the atmosphere; by pressing down upon the controlling valve the air is expelled from the lungs by their own elasticity. This operation of alternate opening and closing of the controlling valve allows of forced respiration until such time as respiration is taken up automatically by the patient. The operation of the apparatus is not in the least tiring, nor does it depend upon high pressure oxygen, nor can it in any way prove dangerous by rupturing the delicate air

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vesicles of the lungs, for the amount and pressure of air entering the lungs are controlled entirely by the lungs themselves.

It was the intention of the clinician to show the "Anesthetic-meter," an invention of Dr. Carl Connell. This apparatus measures the volume of air or gas passing to the patient, thus insuring a perfect and definite mixture of gas and oxygen and, if it is desired, a definite percentage of ether. Its one great feature is that after anesthesia is established, ether will be fed to the patient in a determined amount and no attention need be paid to the patient, for the machine is almost entirely automatic. (It was impossible to show this apparatus for the reason that an accident had happened to the means of transportation the day before.)

(A) A Method of Obtaining a Perfect Fitting Gold Crown from the Dental Laboratory.
Dr. D. W. McLean.
Mount Vernon, N. Y.

First the tooth is "prepared." This can seldom be done without devitalizing the pulp. The most simple and expeditious method of removing the pulp—nitrous oxide and oxygen are administered, and the patient placed in the analgesic state. The pulp is then exposed with a sharp bur. Only the slightest suggestion of pain will be felt. The tooth is then isolated by means of a "J. & J." aseptic doily, and a half tablet of cocain and adrenalin applied to the pulp. A piece of cotton slightly moistened with sterile water is then placed over the cocain tablet, and a firm, strong pressure applied. In the analgesic state the patient will feel no pain, and one strong pressure will usually be enough. The pulp is then removed, and the canals reamed. This will consume about ten minutes.

The tooth is now shaped with diamond discs and stones, so that there is a definite taper toward the occlusal. Enough should be removed from the occlusal surface to accommodate a crown reinforced not only in the cusps, but also in the fissures, where the stress of the proper occlusion will largely fall.

A dentimeter measurement is now taken, and a narrow platinum band made and soldered. This is trimmed to conform to the contour of the gingival gum margin, and is carefully fitted and burnished to the tooth. The band is then placed in position on the tooth and a careful bite and plaster impression are taken. The cast is poured, giving us the band in position on the plaster tooth.

The casts are then articulated and sent to the mechanic, who is instructed to make the crown so that it will extend half-way up the platinum band and occlude properly in that position. The crown is then

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contoured to the band, a piece of solder laid on the joint, and melted with the blow-pipe. This soldering is done on the cast.

The finished crown will slip into place on the tooth without any further grinding or fitting.

(B) A Cast Crown with Steele Facing, to Replace the "Richmond" in Fixed Bridgework.

The root canal is reamed, and the root prepared somewhat as for a Logan or other porcelain crown. The enamel is removed with a suitable scaler, from the mesial, distal and lingual surfaces of the root and the edges beveled. With an Ottolengui reamer the root is faced at a slight incline toward the lingual, but not to a point below the gum margin. From the root canal forward to the facial edge it should be given a more decided slant, to a point *near,* but not *at* or *beyond* the edge of the peridental membrane.

A Steele facing, either anterior or posterior, as the case may require, is then ground to a good joint at the cervical margin, facially, and a gold backing applied and fitted to the facing. A piece of inlay wax, heated, is then applied to the back of the facing and tapered with the fingers to a point, which is pressed into the root canal, and the facing is pressed into position. It is then removed, and the excess wax removed; it is then placed in the root again, and the edges of the wax burnished to the tooth, mesially, distally, and lingually.

If not now in its proper position, remove once more, slightly soften in warm water, and again press into place in the tooth, adjusting carefully to its proper place.

Remove from the tooth, remove the facing, and cast in the usual way. Gives a very strong crown, post, base and backing cast in one piece, and the post fitting the root perfectly. Coin gold, clasp, or twenty-two carat gold preferred for this work.

Orthodontia.
Dr. U. H. Jackson,
New York, N. Y.

In his demonstration, Dr. Jackson presented forty models and appliances, illustrating his method of designing and making his removable regulating appliances, which are readily removed by the patient for cleansing of the teeth and the apparatus, and showing how the apparatus is easily anchored and arranged for the correction of any form of irregularity of the teeth. He described *first* his method of anchoring appliances to the teeth by spring clasp attachments; *second,* his new method of anchoring appliances to the teeth by his locking device.

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With the locking device the appliance is anchored to a distal molar, and a cuspid or bicuspid on each side of the arch.

The locking device or anchorage portions of the appliance consists first in cementing a collar with a buccal lug to each of the anchorage teeth. The locking device is arranged in effect like the action of a door latch, the lug on the collar being of triangular shape, forming a catch. To the mesio and disto-lingual portions of the appliance are attached a wire clasp, shaped to pass from the appliance over the arch at the junction of two of the teeth, and the free end shaped to rest above the buccal lug of the collar cemented on each of the anchorage teeth described. The free end of the clasp is arranged to terminate in a loop, similar to a small wire hook, so that in raising the spring with one's finger in unlocking the device, the finger will not be pricked nor injured in springing outward the end of the wire clasp; also having the clasp terminate in a hook provides the necessary hooks for supporting one end of a rubber equalizing band, used for equalizing.

This anchorage is suitable for supporting the appliance for the treatment of any form of irregularity of the teeth, being especially suited for the equalizing of the upper and lower dental arches in correcting prognathus condition of the mandible; or for protrusion of the upper arch; rotation of any of the teeth; retention of the teeth; their movement in the process, by the use of "rubber equalizing bands" and by the use of "equalizing posts," etc.

The apparatus is adapted for treatment of patients of any age as in moving the teeth for a child, or an adult.

With the collection were shown models of the upper and lower dental arches of children four years old, before and after regulating. One case was of upper protrusion and narrow arches. Accompanying the models were a record card, noting the history of the case, the number of applications of force applied, noting the measurement of each application of force with their dates. The regulation was accomplished by expanding the upper and lower arches and by the equalizing of the dental arches by the use of rubber equalizing bands passed over the hooks described.

He demonstrated the advantage of the tracing and record system that he introduced, to insure the operator in making a definite measurement of each change made in the apparatus, in applying a given amount of force and a definite amount of movement, thus preventing any discomfort to the patient. Each change in the apparatus is controlled by measurement, or a step recorded on the record card. Dr. Jackson pointed out that by using the record card in the manner described, he "reduced orthodontia to an exact science."

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Improvements in Vulcanite Work.
Mr. A. S. Rutherford,
New York, N. Y.

The clinician demonstrated five points by which better fitting plates can be obtained with a minimum of discomfort to the wearer.

A number of plates which had been worn for years were exhibited, to prove that while these methods are not new they are not generally used.

I. If a large spoon excavator is held at an angle of 45 degrees, the handle toward the front of the plaster model, a groove may be made along the edge of the model and given a gradual backward slope, the deepest part being at the back. If the plate is filled up so that the resulting ridge runs along the very back of the plate the air will be entirely excluded when the plate is in use.

II. In a soft mouth better and more lasting results can be obtained by the use of a ridge instead of an air chamber, to make which, the spoon excavator should be held upright and the groove in the plaster model should be about one-third the depth of the excavator, the size of the excavator being about that of a No. 5 bur. Should there be a hard palate the plate should extend beyond it and be lifted the depth of these ridges by the use of air chamber metal. The ridges should always be over the soft parts.

III. If the plate is cut away well, to allow free play of the muscles, it can be worn quite high and thus insure a good fit.

IV. If a blunt wax spatula is rubbed vigorously over the plate all the small defects from the plaster cast will be removed, and it is surprising how many of such defects there are. Defects caused by the knife cutting into the model should be drilled out.

V. A small amount of vaseline, grease or oil of any kind, rubbed over the plate after it is finished will permanently remove the dull appearance from the rubber and enable the wearer to keep the plate clean with little trouble. A small piece of cotton twisted on the end of a match or toothpick, dipped in vaseline and forced between the teeth will greatly improve the appearance of the plate.

Silveroid,
Mr. Wm. W. Atkinson,
Phila., Pa.

There was demonstrated a fusible alloy, silveroid, which had been devised by the clinician to meet the needs for a strong, clean metal for lower bases, which is not open to the objection of excessive weight of fusible alloys due to casting the whole plate of metal so that it might be

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strong enough to withstand wear. Such cases are tiring and uncomfortable and, through pressure, are likely to cause alveolar resorption involving the risk of fracturing the mandible itself. It was stated that with silveroid, a plate the thickness of ordinary wax base plate, cast with a narrow strengthening ridge back of the median line, will sustain a rubber attachment and afford opportunities for artistic and natural effects.

There was also demonstrated methods of inlay making with this alloy, attention being called to the remarkably sharp edges and fine polish, and it was shown that the metal is applicable to the soldering of orthodontia appliances, an ordinary soldering iron being used for that purpose.

The casting machine of Dr. Robert T. Seymour was used for the reason that plates cast under pressure, as in that apparatus, are more dense owing to the condensation of the melted alloy. Worked in this manner, the force of crystalline adhesion is in its best expression and, therefore, greater strength and a finer surface are obtained. Progressive stages of inlay work were shown, together with finished vulcanite attachment, lower sets in both natural and conventional types of construction. Much interest was manifested in the novel and rapid method of finishing the plates by the use of stick tripoli and stick rouge on rag wheels, and the final cleansing and development of a lustrous polish with a clean rag wheel and water.

Thin Plates of Vulcanite.
Dr. W. G. Lewis,
Brooklyn, N. Y.

A properly vulcanized rubber plate gains nothing in necessary strength by being made thick and cumbersome: in point of fact a thin, springy plate of uniform thickness will stand use and abuse better than a thick and more rigid one.

After a plate is vulcanized it should be treated to the minimum amount of scraping and thinning in finishing, as (especially in a thick plate) the outer layers of the vulcanite have much greater strength than the inner portion, and much scraping and thinning removes the outer horn-like layer and leaves only the inner, imperfectly vulcanized, and consequently weaker portion.

The use of a swaged metal trial plate overcomes all the difficulty found in producing a vulcanite plate of known and uniform thickness. It furthermore gives an unyielding and rigid trial plate which will not change shape in the mouth. Soft metal of the type of air chamber

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metal can be obtained in different thicknesses and this, by the use of a rubber swaging press can be swaged up directly on the plaster model without injuring the model in any way, and an ideal trial plate thus produced, the thickness of which is known and uniform, and which will reproduce on the lingual surface of the finished plate all the irregularities and markings found in the roof of the mouth, thus adding to the comfort of the patient and appreciably aiding phonation.

The after-treatment consists in vulcanizing under tin foil, when the finishing is easily accomplished by means of a stiff brush wheel and pumice, followed by polishing.



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"The Perfectly Good Amalgam Filling".

In the last issue we published an article by Dr. Kells, further elucidating his views on the "Passing of the Gold Foil Filling," and as he announces that he therewith closes the discussion, it would be discourteous to reopen it, but at the end of his communication he says: "And Dr. Ottolengui takes out perfectly good amalgam fillings, to be replaced by inlays." Thus a new topic for discussion is provided.

Why should any man remove a perfectly good amalgam filling? What is a perfectly good amalgam filling? The first difficulty that is met in considering this subject at all is the unfortunate fact that the term "amalgam filling" has no definite meaning. When we speak of a "gold foil filling," at least we know that the metal is of a definite quality, so that the difference between gold foil fillings made by different men is almost wholly dependent upon the skill of the operator. Of amalgams, like Heinze's pickles, there are "fifty-seven varieties," and of these varieties, if we accept the views of Dr. Black, Dr. Crandall, and others who have investigated this great problem, there are perhaps not more than seven from which a perfectly good amalgam filling can be made, even by the most skilled operators. And even with these most perfect alloys we are informed that methods of manufacture, age, and other factors, including technique of amalgamation and insertion, render the absolutely perfect result more or less chimerical. How frequently, then, will Dr. Ottolengui or any other operator find opportunity to remove "perfectly good amalgam fillings?"

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What is a Perfect Amalgam Filling?

By what standard shall we judge the perfect goodness of an amalgam filling? We firmly believe that one of the most important requisites of a perfect amalgam filling, together with the technique of attaining it, had not been described prior to the article by Dr. Pond in the February ITEMS OF INTEREST, whose position is further fortified by Dr. Frahm in the present issue.

The carving of amalgam into a good semblance of the masticating surfaces of molars and bicuspids, the carving being done prior to the setting of the material, was not possible before the advent of the quick-setting amalgams. And just as the feasibility of reproducing these surfaces with the gold inlay is only just dawning upon the minds of the best operators, so, too, it would seem that few, if any, have heretofore taken advantage of the rapid setting of amalgam in order to carve up cusps and sulci while the material is yet plastic.

The writer recalls that some twenty years ago he became possessed of two lower sixth-year molars, each having three perfectly defined roots. From their roots one might at first glance suppose them to have come from the upper jaw. The crowns were badly destroyed by caries, and in order to restore their forms, amalgam was used. The difficulty of correctly carving these fillings, so that the characteristic shapes of lower molars would lead one to recognize that, despite their three roots, the teeth came from the lower jaw, was discovered at this time. This difficulty of carving amalgam which has already hardened is even greater in the mouth, and the time required, if nothing else, would prohibit such work with a material commonly used to lessen the expense to the patient. The new technique of utilizing a quick setting amalgam, and carving the filling during the plastic stage, opens up important possibilities, and it is devoutly to be hoped that better work will be done with amalgam, because of the pronouncement of this propaganda.

The writer recently was demonstrating to a post-graduate study class the importance of restoring occlusal form, and was exhibiting some specimens of large amalgam fillings of which he made the following comment:

"Apparently these fillings were carved (?) with a ball of wet cotton!" One of the men present replied: "That is exactly what we were taught to do in college."

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So long as the writer remains in his present mind as to the importance of restoring the masticatory function of molars and bicuspids, by copying the normal shapes of the occlusal surfaces, just so long will he feel entirely authorized to remove amalgam fillings "carved" with a ball of wet cotton, however perfect otherwise they may be. But be it added, that up to date he has not as yet removed any amalgam filling which did not show defects other than that of being wrongly shaped, so rare is the "perfectly good amalgam filling."



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I MUST CONFESS that I have no absolutely fresh table talk at present. Truth is that the blizzards have made most of the suburban trains late, and even the uptown trolleys have been slow, so that most of the men have rushed off home after meetings, without waiting to grill the essayists, and professional discussionists, in the grill rooms. There is still six feet of snow piled in front of my home, so that a taxi cannot land me near my house, even if I could induce one to attempt the trip.

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THIS, THEN, IS a good opportunity to record some comments that have been received in regard to previous talks. About the middle of January I received a communication from a bashful gentleman, who asks me to sign his name simply "E. J. K.," but who evidently also knows his P's and Q's. Of his own letter he says, "There may not be any merit in what I have written, but I voice the sentiments of a great many in the profession." There is merit in what he has written, and it is therefore set down here in black type so that it may convey a hint to them that need it most.

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E. J. K. WRITES as follows: "I heartily approve of the new departure announced in the January issue under the title 'Around the Table.' I am one of the little fellows who possibly would like to say something at State Society meetings, but refrain from doing so for reasons best known to men similarly minded. My criticism is that the little fellow never gets a chance in State Society meetings, the control of which is in the hands of a few of the 'Old Guard,' who are always occupying the center of the stage in the glare of the spot light, and who believe that their own refulgence is so dazzling as to dim the calcium rays in which they bask.

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"IF AN UNKNOWN advance a suggestion, or a new idea, or attempt to criticise a paper of one of the 'big boys,' the 'Old Guard' arise *en masse* and so surround the 'little presumer' with icy atmosphere, that his brain

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cells become frozen and his ideas fall like icicles from his lips, and he is so chilled that he does not thaw out until a month or two later.

"THIS CONDITION of affairs seems not to be localized, because I speak from experience in three State societies, in one of which I must admit, however, that the leaders are sufficiently broad-minded to realize that the 'little fellow' may be worthy of cultivation. One society which I have in mind, which I think is the second largest in the United States, is controlled by six men who are practically a mutual booster association. I am personally acquainted with a number of brainy 'little men,' members of this society, who never had a chance to be heard in many years, but who have eventually expounded good ideas and have contributed to dental progress by presenting their thoughts elsewhere. In this society it would seem that all the glory is for the few who pose and strut about like pouter pigeons, while the rest of the members must be content to be the gallery, taking their cue and applauding at the appropriate moments. May your new department be an open forum for all of us."

WELL, THERE YOU ARE. That is what E. J. K. thinks about it, and I have no doubt that A. B. C., and X. Y. Z., "Constant Reader," "Onlooker" and others, all agree with him. And there is no doubt some considerable truth in the arraignment. But the Old Guard is not wholly blamable; the "little fellow" is a bit in the wrong also. However, I do not want to hurt anyone's feelings, big or little, so I will just make a suggestion, and pass to another subject. It is a whole lot easier to criticise than it is to do better. This is well known to the executives of all societies. Nevertheless, it would be well to recognize that the little fellow has some rights, and some possibilities.

THERE IS LITTLE doubt that the great prominence of Illinois dentists is largely due to a sort of unwritten rule (not perhaps openly admitted, but nevertheless true), to seek for essayists outside of Illinois, as infrequently as possible. Thus they have encouraged their own men to do things, and they have become important factors in dental progress in this way. Other States might follow this example with profit both to the societies and to the members. In athletics it is a common practice to hold a set of games, or to have at least one race, for "those that have never competed before." Why would it not be a profitable proposition for Executive Committees to become acquainted with the work of their own men, and to set aside one session of a meeting for untried home talent? Some of our best athletes have been "discovered" in this manner. *Verbum sap.*

DR. F. W. RICE, of Sayre, Penn., wishes to inform his fellows Around the Table that when flasking a repair of a denture, time can be saved by placing a piece of tissue paper (cigarette paper), over the first plaster placed in the flask and pressing the same down smoothly over the soft plaster, and then filling the flask as usual without waiting for the first

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to harden. What Dr. Rice says is true, and separation will be further facilitated by dusting talcum powder freely over the paper before pouring the second half of the flask.

THE DISCUSSION on root canal filling, in the February table talk, has brought in a number of letters containing valuable comments which will be reported later, but one letter contains a curious statement which invites immediate comment. The writer alluding to Dr. Pond's paper advocating the restoration of occlusal surfaces with amalgam, says that Dr. Pond's paper is worth more than all the papers on root canal filling and gold inlays that have appeared in the journals of late. Dr. Pond's paper was certainly important because it was a suggestion of better methods. Similarly, all descriptions of gold inlay methods are important, if they record better ways of obtaining better results. But it must be remembered that neither the best amalgam filling nor the best gold inlay can permanently save a tooth the root canals of which are improperly filled. Nor is there any department of practice in which the dental profession as a whole is so lamentably incompetent as in root canal treatment and filling.

STUDY CLASSES are being formed in increasing numbers in all large cities. So great do I believe the demand for advanced methods of root canal treatment, that I can imagine no better work for the dental societies of this country to engage in during the next winter than the formation of classes, under the tutelage of experts in the field, for the study of the technique of root canal filling. Anyone who tests the question fairly, in his own work, will soon discover, if the X-ray be employed, that his success in treating root canals is far less than he had fondly believed. The filling of even single rooted canals is often so much more difficult than it has been supposed to be, that it is almost obligatory to have two or more radiographs of every case undertaken in order to accomplish successful results.

THE EXPENSE of radiography may at present seem to render this course prohibitory, and the cost of installing X-ray apparatus has deterred many from adopting this method of aiding and checking up their technique. But all who, after hesitation, have finally taken up radiography have discovered that the first cost of the apparatus has quickly been returned in fees. Patients cheerfully pay charges for competent root canal fillings, when it is explained that a well filled root, with cavity filled with amalgam, is worth more than a poorly filled root with a gold crown, or expensive porcelain inlay surmounting it.

JUST SO SOON as a great majority of dentists decide that patients must be taught that it is worth more to have the root filled, than to have the tooth filled, and that their health demands good root work more than good fillings, just so soon will the cost of radiography be so reduced as to be within the reach of all. With more men referring patients for radiographs of roots, there will arrive a greater number of specialists in radiography, and a reduction in the charges therefor. With a greater

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number of men installing X-ray outfits there will be produced an efficacious apparatus at low cost.

WHY WOULD IT NOT be a grand idea for the executive officers of some of our State societies, who are at present engaged in preparing society programs, to undertake the formation of classes in root canal filling, at their coming meetings? Undoubtedly, experts could be obtained who would clinically demonstrate the successful opening, cleansing and filling of root canals, using the X-ray as an aid in the work. Such demonstrations if taken up seriously throughout the country would revolutionize the present attitude toward this branch of dental practice.

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The Naval Dental Corps.

To the Editor:

Dear Sir—For the general information of the dental profession and those who may desire to enter the Dental Corps of the United States Navy, I desire to state that the Act of August 22, 1912 (Naval Appropriation Bill, making appropriations for the Navy for the ensuing year) contained a provision authorizing a Dental Corps for the Navy.

In addition to the dental corps, to consist of thirty acting assistant or assistant dental surgeons, the age of whom on appointment must be between twenty-four and thirty-two years of age, provision was made for a limited number as acting assistant dental surgeons for temporary service.

After having passed the required examinations, appointees serve a probationary period as Acting Assistant Dental Surgeons for three years, at the end of which time they are examined to determine their fitness for appointment as assistant dental surgeon.

Upon successfully passing the examination for appointment as assistant dental surgeon, the candidate receives a commission, being nominated by the President and confirmed in the Senate in the same manner as other commissioned officers of the Navy.

Officers of the Dental Corps have the rank of lieutenant (junior grade) and are entitled to all the military courtesies and consideration that go with that rank and are accorded officers of other branches of the service in a similar grade.

They wear the same uniform as other officers of the Navy, with a designating device distinctive of their corps.

Pay of Naval Dental Corps.

Officers of the Dental Corps receive the pay and allowances of lieutenant (junior grade), namely, $2,000, or $166.66 per month. At the end of each five years' active service an increase of 10 per cent. is given, until at the end of twenty years the maximum increase of 40 per cent. is received, making $2,800 annually, or $233.33 per month, with a further increase of 10 per cent. when serving at sea or on a foreign station. When on shore duty they are furnished with quarters either in kind, three rooms, or commutation at the rate of $36 per month. An allowance for fuel and light is also provided.

When traveling under orders, mileage is allowed at the rate of eight

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cents per mile. Leave of absence on full pay may be granted by the proper authority at the rate of one month per year. Absence from duty on account of sickness involves no loss of pay.

The tenure of office in the Dental Corps of the Navy, except in case of acting assistant dental surgeons appointed for temporary duty only, is for life, unless sooner terminated by removal, resignation, disability, or other casualty.

Retirement. All officers of the Dental Corps (except temporary appointees) are retired from active service at the age of sixty-four years, and when so retired (or when retired from active service for disability or other casualty contracted in the line of duty before that age) receive an annual pay for life amounting to three-fourths of the highest pay of their grade at the time of retirement.

When any officer of the Navy, including dental officers, has been thirty years in the service, he may, upon his own application, in the discretion of the President, be retired from active service and placed on the retired list with an annual pay for life amounting to three-fourths of the highest pay of his grade at the time of retirement.

Immediately upon official notification of the death of any officer, including dental officers, from wounds or disease not the result of his own misconduct, there will be paid to the widow, children or dependent relative of such officer, previously designated by him, an amount equal to six months' pay at the rate received by such officer at the date of his death, less $75 to pay the expense of interment; but the residue, if any, of the amount so reserved will be paid subsequently to the widow or other designated beneficiary.

It is believed that the status, pay and allowances and other incidentals of the corps should make the service desirable and attractive to such dental practitioners as may think they would enjoy a naval life. Assignment to duty may be made to navy yard, naval training stations, hospital ships and aboard vessels of the fleet.

The physical examination for candidates to the Dental Corps is thorough, and he is required to certify, on oath, that he is free from all mental, physical and constitutional defects.

A knowledge of the common school branches is required. Credit will be given for knowledge of languages and the sciences, which, howere, is not essential.

For further information address the Surgeon General, U. S. N., Navy Department, Washington, D. C.

EMORY A. BRYANT,
A. A. Dental Surgeon, U. S. N.

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Dr. John Nathan Crouse.

Died, Chicago, Ill., January 16, 1914, of heart failure, age 71.

Dr. Crouse was born September 15, 1842, near Downington, Pa. He received a common school education in Illinois and Pennsylvania and later at Mount Carroll Seminary, Mount Carroll, Ill. Began practice in 1864 at Mount Carroll. In March, 1867, graduated with degree of D.D.S. from Pennsylvania College of Dental Surgery. In 1868 he opened an office in Chicago and practiced continuously from that time until his last illness.

Dr. Crouse was one of the most marvelous executive men that the dental profession has ever seen. He was possessed of an indomitable perseverance and will power, and rarely set himself a task which he did not pursue until its completion.

Early in his career, 1864, he aided in the organization of the Chicago Dental Society, of which he was the last living charter member. He was a president of the National Dental Association and for a long time was associated with its Executive Committee, during which years the society enjoyed some of the finest meetings in its history.

Perhaps he was best known to the dental profession through his having founded the Dental Protective Association, an organization which was brought together for the avowed purpose of defending dentists from imposition under process patent rights. The writer well remembers the great meting at Masonic Temple, New York, at which Dr. Crouse first propounded the purposes of this association to the dentists of this section. Dr. Crouse by his oratorical powers, forceful arguments and marvelous magnetism, practically hypnotized the tremendous audience present so that a very large percentage of them became voluntary solicitors for memberships in the Dental Protective Association. This one characteristic of Dr. Crouse stands out more conspicuously in the writer's memory of him than all else that might be said of him and all things that he may have done.

He was a man who made tremendous friendships and equally strenuous enmities, but in every debate, regardless of however venomous an attack might be, Dr. Crouse retained his calm dignity and at the proper moment would come forward with arguments and almost hypnotic

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appeal, which invariably induced those present to vote with him. The writer well remembers and is glad to record his first association with Dr. Crouse. He was one of those who became fully convinced of the unselfish purposes of the man, and though in later years he disagreed with Dr. Crouse in regard to methods, he never doubted that the man followed his own bent because he was convinced that his way was the best way.

The dental profession owes Dr. Crouse a tremendous debt of gratitude for what he did for them in the life-long battle against process and other patents, and it is an unfortunate fatality that he should have died just before the Golden Anniversary of the Illinois State Dental Society and of the Chicago Dental Society, whereat it had been the intention of his confrères to publicly honor him. As it is, we understand that a Memorial Meeting will be held by the Chicago Dental Society.

While, perhaps, Dr. Crouse has made his greatest imprint upon the minds of the dental profession throughout the world in consequence of his strenuous battle for their rights, he made an even greater impression upon his clientèle, and he was one of the finest dental practitioners in the United States, one of the masters of the restoration carious teeth with gold foil. The writer has seen many fillings from his hand which had already served ten, twenty and even thirty years without a mar upon their surfaces or leakage at any of the borders.

Dr. Crouse was likewise the president of the Dental Protective Supply House and published the *Dental Digest* until 1908.

He was married in 1870 to Miss Ruma A. Hull, of Clinton, N. Y. His wife and one son survive him.

His body was cremated and his ashes interred at Rose Hill Cemetery, Chicago, January 19, 1914. R. O.

In Memoriam Resolutions Adopted by the New Jersey State Dental Society.

Dr. Charles S. Stockton.

Whereas, It has pleased our Heavenly Father to remove to a higher sphere our last Charter Member, Charles S. Stockton, D.D.S., therefore be it

Resolved, That we mourn the loss of a true friend, a conscientious advisor, a noble Christian character, an able and forceful speaker and debator, always interested in the higher motives of our society, and the uplifting of our profession; the broadening of our sphere of usefulness. and the placing of our profession on the level with the other learned professions.

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Always willing and anxious to help the young man in his endeavor for higher usefulness, and ever having an interest single to the good of humanity.

Resolved, That a copy of these resolutions be spread upon the minutes of our society, sent to the widow, and published in the dental journals.

SAMUEL C. G. WATKINS,
GEORGE M. HOLDEN,
HERBERT S. SUTPHEN, Chairman.

Dr. Henry Augustus Hull.

Dr. Henry Augustus Hull was born at Columbia, Pa., October 19, 1831. Died March 5, 1913, at his home in New Brunswick, N. J., in which city he lived for forty years. The deceased traced his genealogy back to George Hull, of Fairfield County, Conn., who sailed from Plymouth, England, on the ship *Mary and John,* and arrived May 30, 1630, at a place on Nantasket, afterward called "Hull."

Although he lived beyond the allotted time of life, Dr. Hull always took an active interest in everything going on. His military bearing on the street has been greatly missed by those in the habit of daily meeting him. Members of the same profession who knew him well familiarly called him "Pa Hull," which he accepted with pleasure. He had a strong social nature and craved close companionship, but unfortunately death claimed those near and dear to him, so his home life was a lonely one for a number of years. Being fond of travel, it was his fortune to have covered all of the principal cities in every State in the Union.

Dr. Hull served his country in the Civil War from its beginning to the end, and served his city in several important positions. Several local organizations in which he held office sought his advice. His Masonic career was long and extended through all its rites. The Central Dental Association of Northern New Jersey and the New Jersey State Dental Society honored him with their highest gift. For several years and up to the summer before his death, Dr. Hull held the office of treasurer of the State Dental Society. Its membership had grown to such proportions he felt that the work should be taken up by a younger man, so resigned. Although taking no part in the society's debates, he could always be depended upon to support any measure which would advance the society's interest.

Whereas, It has pleased Almighty God to remove from our midst by death our esteemed associate, be it

Resolved, That we, the New Jersey State Dental Society, feeling keenly the loss we have sustained, hereby express our sorrow at the sud-

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den termination of the career of Dr. Henry Augustus Hull, and that this society hereby extend to his immediate family its sincere sympathy, and be it further

Resolved, That a copy of these resolutions be spread upon the minutes of the society and that a copy thereof be sent to the dental journals for publication.

HARVEY IREDELL, D.D.S.,
FRANK L. HINDLE, D.D.S.,
WILLIAM E. TRUEX, D.D.S.,
Committee.

Dr. Norman W. Kingsley.

Resolved, That we mourn the loss of a true friend, a conscientious advisor, a noble Christian character, an able and forceful speaker and debator, always interested in the higher motives of our society, and the uplifting of our profession; the broadening of our sphere of usefulness, and the placing of our profession on the level with the other learned professions.

Always willing and anxious to help the young man in his endeavor for higher usefulness, and ever having an interest single to the good of humanity.

Resolved, That a copy of these resolutions be spread upon the minutes of our society; sent to the widow, and published in the dental journals.

Signed by committee:
DR. W. W. HAWKE,
DR. R. OTTOLENGUI,
DR. J. S. CURTIS.

Dr. Edwin Chew.

Whereas, It has pleased Almighty God to take out of this world the soul of Dr. Edwin Chew, an honorary member of the New Jersey State Dental Society, a man of character and resourcefulness, a good workman and a respected member of the community where he passed the whole of his life; therefore be it

Resolved, That we put on our minutes a record of his character and work, both of which were far above the ordinary. He was a self-made man, and a good one, well esteemed by all who knew him and commanding the respect of clients, friends and acquaintances. He began his work in the days when each man was compelled to make many of the instruments and teeth he used and this he did successfully, finding the necessary materials close at hand and out of our native spar and silex carving by hand teeth which are the admiration of the men of to-day.

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He read many of the journals, advanced with the profession and at the close of his long and busy life, though eighty-four years old, was among the leaders in his special line. Owing to advancing years he was unable to attend the meetings of the society, and was elected an honorary member, continuing so until his death.

Resolved, That a copy of these resolutions be sent to the family and printed in dental journals.

Signed by the committee:

JOSEPH G. HALSEY,
J. E. JAQUETTE,
S. G. WALLACE.

Dr. William P. Richards.

Whereas, In view of the loss we have sustained by the decease of our friend and associate, Dr. William P. Richards, and of the still heavier loss sustained by those who were nearest and dearest to him; therefore be it

Resolved, That it is a just tribute to the memory of the departed to say that in regretting his removal from our midst we mourn for one who was in every way worthy of our respect and regard.

Resolved, That we sincerely condole with the family of the deceased on the dispensation with which it has pleased Divine Providence to afflict them, and commend them for consolation to Him who orders all things for the best.

Resolved, That this heartfelt testimonial of our sympathy and sorrow be forwarded to the family of our departed member by the secretary of this meeting.

M. R. BRINKMAN,
H. S. SUTPHEN,
S. C. G. WATKINS.

Dr. Lewis S. Marsh.

Whereas, Dr. Lewis S. Marsh, an honored member of this society, having been removed from us by the Divine Providence, it is but fitting that we should make a record of our loss thus sustained; therefore be it

Resolved, That our sympathies be extended to his family in their bereavement, while we cannot but feel grateful to the Giver of all, that he was permitted to live such a long and useful life. Be it therefore

Resolved, That these resolutions be incorporated in the minutes of this society and that a copy be transmitted to the family of the deceased.

EDWARD D. FROST, Chairman,
OSCAR ADELBERG,
W. WOOLSEY.

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National Society Meetings.

American Institute of Dental Teachers, Ann Arbor, Mich, January 28-30, 1915.
Secretary, Dr. J. F. Biddle, 517 Arch St., N. S., Pittsburgh, Pa.

National Dental Association, Rochester, N. Y., July 7-10, 1914.
Secretary, Dr. Otto U. King, Huntington, Ind.

American Society of Orthodontists, Toronto, Canada, July 2-3, 1914.
Secretary, Dr. Wm. Ernest Walker, 629-631 Maison Blanche, New Orleans, La.

Panama-Pacific Dental Congress, San Francisco, Cal., 1915.
Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

Canadian Dental Association, Winnipeg, Manitoba, May 26, 27, 28, 29, 1914.
Secretary, Dr. M. H. Garvin, 314 Somerset Blk., Winnipeg, Manitoba, Canada.

State Society Meetings.

Arkansas State Dental Society, Little Rock, Ark., June 4, 5, 6, 1914.
Secretary, Dr. C. L. Hunt, Fort Smith, Ark.

California State Dental Association and Southern California Dental Association, Yosemite Valley, Cal., June 29-30, July 1-2, 1914.
Secretary, Dr. E. E. Evans, Union Savings Bank Bldg., Oakland, Cal.

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COLORADO STATE DENTAL SOCIETY, Manitou, Colo., June 18-20, 1914.
Secretary, Dr. E. W. Spencer, 120 Pope Block, Peblo, Colo.

CONNECTICUT STATE DENTAL ASSOCIATION, Hartford, Conn., April 21-23, 1914.
Secretary, Dr. Arthur V. Prentis, New London, Conn.

FLORIDA STATE DENTAL SOCIETY.
Secretary, Dr. Alice P. Butler, Gainesville, Fla.

GEORGIA STATE DENTAL SOCIETY, Atlanta, Ga., June 4-6, 1914.
Secretary, Dr. M. M. Forbes, Candler Bldg., Atlanta, Ga.

INDIANA STATE DENTAL ASSOCIATION, Indianapolis, Ind., May 19-21, 1914.
Secretary, Dr. Otto U. King, Huntington, Ind.

IOWA STATE DENTAL SOCIETY, Des Moines, Iowa, May 5-7, 1914.
Secretary, Dr. C. M. Kennedy, Des Moines, Iowa.

LOUISIANA STATE DENTAL SOCIETY, Baton Rouge, La., June 4-6, 1914.
Secretary, Dr. E. B. Ducasse, Maison Blanche, New Orleans, La.

MAINE DENTAL SOCIETY, Augusta, Me., June 25-27, 1914.
Secretary, Dr. I. E. Pendleton, Lewiston, Me.

MARYLAND STATE DENTAL SOCIETY.
Secretary, Dr. F. W. Drew, 701 N. Howard St., Baltimore, Md.

MASSACHUSETTS DENTAL SOCIETY, Boston, Mass., May 7-9, 1914.
Secretary, Dr. A. H. St. C. Chase, Everett, Mass.

MICHIGAN STATE DENTAL SOCIETY, Detroit, Mich., April 9-11, 1914.
Secretary, Dr. F. Ward Howlett, Jackson, Mich.

MINNESOTA STATE DENTAL ASSOCIATION, Duluth, Minn., August 6-8, 1914.
Secretary, Dr. Benjamin Sandy, Syndicate Bldg., Minneapolis, Minn.

MISSOURI STATE DENTAL ASSOCIATION, St. Louis, Mo., April 21-22, 1914.
Secretary, Dr. S. C. A. Rubey, Warrensburg, Mo.

MISSISSIPPI DENTAL ASSOCIATION, Vicksburg, Miss., June 23-25, 1914.
Secretary, Dr. M. B. Varnado, Osyka, Miss.

MONTANA STATE DENTAL SOCIETY, Great Falls, Montana, June, 1914.
Secretary, Dr. F. W. Adams, 14-15 Chicago Block, Billings, Montana.

NEBRASKA STATE DENTAL SOCIETY, Lincoln, Neb., May 19-21, 1914.
Secretary, Dr. H. J. Porter, Cambridge, Neb.

NEW HAMPSHIRE STATE DENTAL SOCIETY, Weirs, N. H., June 17-19, 1914.
Secretary, Dr. Louis I. Moulton, Concord, N. H.

NEW JERSEY STATE DENTAL SOCIETY, Ocean Grove, N. J., July 15-18, 1914.
Secretary, Dr. John C. Forsyth, 430 E. State St., Trenton, N. J.

NEW YORK STATE DENTAL SOCIETY, Albany, N. Y., May 14-16, 1914.
Secretary, Dr. A. P. Burkhart, 52 Genesee St., Auburn, N. Y.

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North Carolina Dental Society, Hendersonville, N. C., June 24-27, 1914.
Secretary, Dr. J. Martin Fleming, Raleigh, N. C.

Ohio State Dental Society, Columbus, O., December 1-3, 1914.
Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

Pennsylvania State Dental Society, Phila., Pa., June 30, July 1-2, 1914.
Secretary, Dr. Luther M. Weaver, Phila., Pa.

Tennessee State Dental Association, Chattanooga, Tenn., June 4-6, 1914.
Secretary, Dr. C. O. Rhea, 625½ Church St., Nashville, Tenn.

Texas State Dental Association, Fort Worth, Texas, April 13-17, 1914.
Secretary, Dr. J. G. Fife, Dallas, Texas.

Utah State Dental Society, Logan, Utah, June 19-20, 1914.
Secretary, Dr. I. P. Stewart, 1st Nat. Bank Bldg., Logan, Utah.

Vermont State Dental Society, Rutland, Vt., May 21-23, 1914.
Secretary, Dr. P. M. Williams, Rutland, Vt.

West Virginia State Dental Society, Huntington, W. Va., August 12-14, 1914.
Secretary, Dr. A. C. Plant, 802 Schmulbach Bldg., Wheeling, W. Va.

Wisconsin State Dental Society, Fond-du-Lac, Wis., July 14-16, 1914.
Secretary, Dr. O. G. Krause, Wells Bldg., Milwaukee, Wis.

The American Dental Society of Europe.

The forty-first annual meeting of the American Dental Society of Europe will be held in Paris, France, July 30, 31-August 1, 1914, at the Hotel Continental. All members of the profession are cordially invited to be present.

G. B. Hayes, Secretary.

17, Ave. de l'Opéra, Paris, France.

Mississippi Dental Association.

The thirty-ninth annual meting of the Mississippi Dental Association will be held in Vicksburg, June 23, 24 and 25, 1914.

M. B. Varnado, Secretary.

Osyka, Miss.

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Iowa State Dental Society.

The fifty-second annual meeting of the Iowa State Dental Society will convene at Des Moines, Iowa, May 5, 6 and 7, 1914, beginning Tuesday, May 5th, at 9 A. M. Elaborate clinics and lectures and a large exhibit will be presented.

Further information will be furnished upon request from ethical practitioners of other States contemplating a visit to the meeting, and to whom we extend a cordial invitation.

Exhibitors desiring space should apply to Dr. W. J. Cameron, Des Moines, Iowa.

C. M. KENNEDY, Secretary.

Des Moines, Iowa.

Susquehanna Dental Association of Pennsylvania.

The annual meeting of the Susquehanna Dental Association will be held at the Water Gap House, Delaware Water Gap, Pa., May 26, 27 and 28, 1914.

E. J. DONNEGAN, Secretary,
Scranton, Pa.

W. C. MIDDAUGH, President,
Easton, Pa.

Maryland Board of Dental Examiners.

The Maryland Board of Dental Examiners will meet for examination of candidates for certificates May 27-28, 1914, at the dental department of the University of Maryland at 9 A. M.

For application blanks and further information apply to

F. F. DREW, Secretary.

701 N. Howard St., Baltimore, Md.

Michigan State Board.

The next meeting of the Michigan State Board of Dental Examiners will be held at the Dental College, Ann Arbor, commencing Monday, June 15th, and continuing through the 20th. For application blanks and full particulars address

F. E. SHARP, Secretary.

Port Huron, Mich.

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Michigan Licentiates Please Notice.

In compliance with Section 5 of Public Act No. 183, of 1913, which is as follows:

> "Every registered dentist shall, on or before the first day of May of each year, except the one in which he is registered, pay to the Secretary of the Board of Dental Examiners a license fee of one dollar. The year for which a fee shall be paid shall begin on October 1st following the May when it becomes due, and end the succeeding September 30th. In case any person defaults in paying said fee, his license may be revoked by the Board of Dental Examiners, on thirty days' notice in writing from the Secretary, unless within said time said fee is paid."

Notices will be mailed to all dentists registered in Michigan, to their last known address, on or before April 15, 1914. Failure to receive such notice will not be an exemption or an excuse for non-payment. In such cases all persons should notify the Secretary, giving their correct address. This also applies to all those living outside the State.

Respectfully,

F. E. Sharp, Secretary.

Port Huron, Michigan.

Upper Peninsular Dental Society.

The next meeting of the Upper Peninsula Dental Society of Michigan will be held in Escanabe, Mich, June 5-6, 1914.

Dr. C. A. Cotton, Secretary.

Escanaba, Mich.

Louisiana State Dental Society.

The thirty-sixth annual meeting of the Louisiana State Dental Society will be held in Baton Rouge, La., June 4-6, 1914.

Dr. E. B. Ducasse, Secretary.

Maison Blanche, New Orleans, La.

Maine Board of Dental Examiners.

A meeting of the Maine Board of Dental Examiners will be held at the State House, Augusta, Me., June 23 and 24, 1914, for the examination of applicants. For applications and further information apply to

I. E. Pendleton, D.M.D., Secretary.

54 Pine St., Lewiston, Me.

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Association of Military Dental Surgeons of the United States.

On January 24, 1914, at a meeting held at the Army and Navy Club, New York City, the Association of Military Dental Surgeons of the United States was organized, the membership in which is open to dental surgeons, acting dental surgeons of the United States Army and ex-dental surgeons.

The officers chosen to serve until the Rochester meeting (at which time a new election will be held) are:

President, Wm. C. Fisher; Vice-President, John D. Milliken, San Francisco; Treasurer, Ralph W. Waddell; Secretary pro tem, Wm. C. Fisher, 373 Fifth Avenue, New York City.

Advisory Council Ex-Dental Surgeons: O. M. Sorber, Updyke & Foster, Chas. D. Long, E. J. Craig, Samuel Hussey, H. C. Reitz, John S. Marshall, Wm. Ware.

The object of this organization is to foster a higher *esprit de corps*, encourage the interest of the dental profession at large in the personnel of the dental corps and to collect for the dental profession such data and information pertinent to the practice of dentistry in the military world, as may from time to time be demed worthy of presentation.

Permanent organization will be effected at Rochester, New York, the afternoon of the first day of the meeting of the National Dental Association, July 7th.

New Jersey State Board of Dental Examiners.

The New Jersey State Board of Dental Examiners will hold their regular annual meeting and examination in the Assembly Chamber of the State House, Trenton, N. J., on June 29, 30, and July 1, 1914. License fee, $25.00. No interchange of license. Applications must be filed *complete* at least ten days before date set for examination.

All applicants for a license to practice dentistry in New Jersey "shall present to said Board a certificate from the Superintendent of Public Instruction, showing that before entering a dental college, he or she had obtained an academic education consisting of a four years' course of study in an approved public or private high school, or the equivalent thereof." Therefore, the secretary will issue application blanks to applicants *only* upon the presentation of the required dental certificate from the Superintendent of Public Instruction, Trenton, N. J.

A bridge, consisting of three or more teeth, exclusive of abutments, and one Richmond Crown (in gold), will be required, mounted and articulated, as a practical test in Prosthetic Dentistry, in place of a full

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set of teeth soldered upon a gold or coin silver plate hitherto required.

For further particulars apply to

ALPHONSO IRWIN, D.D.S., Secretary.

425 Cooper St., Camden, N. J.

Wisconsin State Board of Dental Examiners.

The Wisconsin State Board of Dental Examiners will convene in Milwaukee at Marquette University, on June 22, 1914, at 2:00 o'clock P. M., for examination of applicants to practice in Wisconsin.

High school diploma, application and $25.00 fee to be filed with the secretary fifteen days prior to above date.

Dental diploma to be presented in advance of the examination.

Junior dental students presenting a clear card for two years' unconditioned work from a reputable dental college and filing a high school diploma, or its full equivalent, will be permitted to participate in the theory examination in the following six major subjects:

Anatomy, Physiology, Histology, Chemistry, Bacteriology, Materia Medica.

The grades made in these subjects will be credited at subsequent examinations.

Special application blanks for this examination and $10.00 fee, together with high school credits to be filed fifteen days in advance.

W. T. HARDY, Secretary,

1404 Majestic Bldg., Milwaukee, Wis.

F. A. TATE, President.

Pennsylvania Board of Dental Examiners.

The next regular examination of the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh on Wednesday, Thursday, Friday and Saturday, June 10, 11, 12 and 13, 1914. Application blanks can be secured from the Department of Public Instruction. Harrisburg. Any further information can be secured from

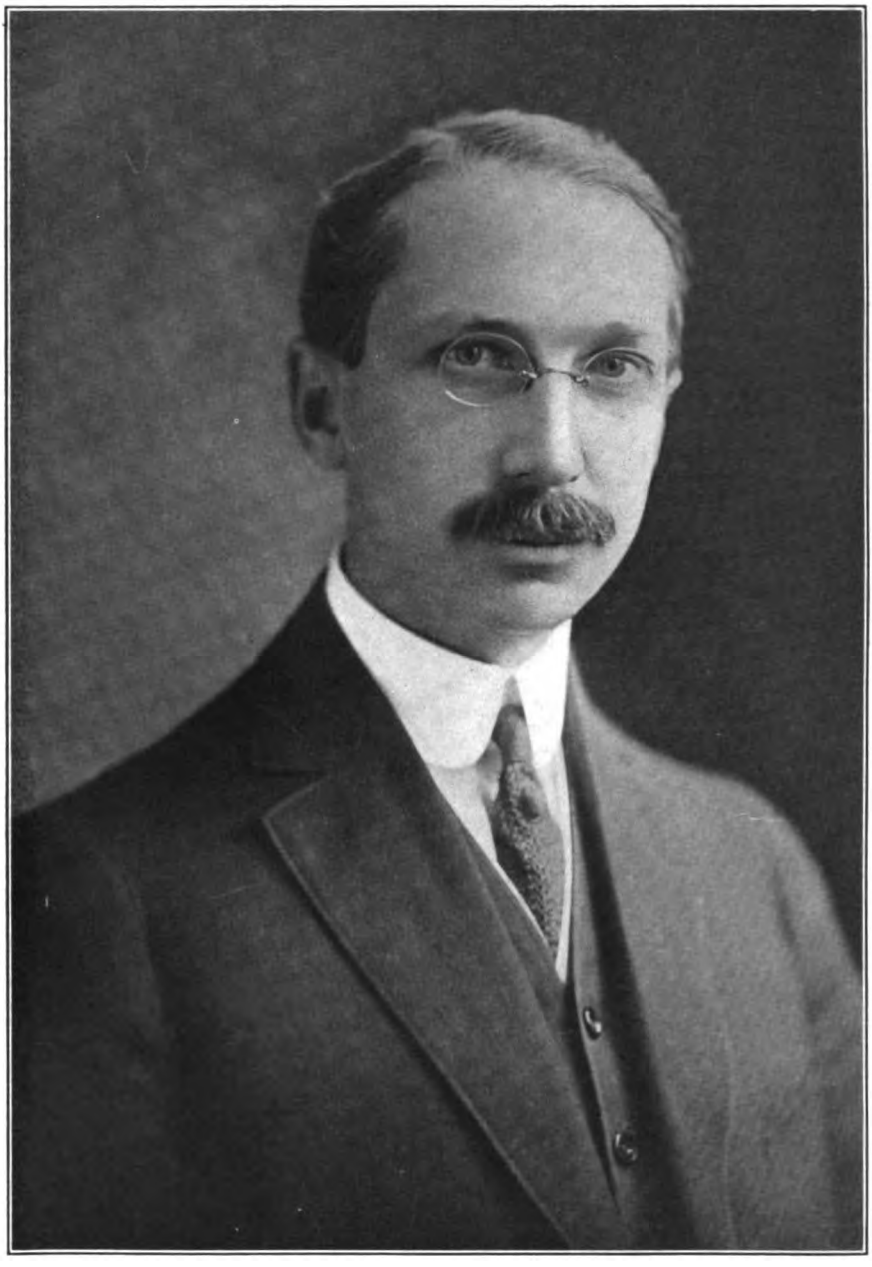
ALEXANDER H. REYNOLDS, Secretary.

4630 Chester Ave., Philadelphia.

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DR. W. H. LOGAN
President Illinois State Dental Society

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Bacteriology in its Relationship to the Oral and Nasal Cavities.*

By John Bethune Stein, M.D.
Professor of Physiology and Histology at the New York College of Dentistry, New York.

I.

The purpose of this article is to treat briefly of certain of the more important pathogenic micro-organisms, most of which are found in the mouth and for all of which the mouth and nose may be the port of entry into the body.

The mouth, especially by virtue of the moisture and pabulum always present, affords these micro-organisms not only an abode, but an excellent breeding place. With each inspiration through the mouth micro-organisms and spores are deposited on the mucous membrane of this cavity, and great numbers are introduced with food and drink, and by contact with drinking and eating utensils, tooth brushes, toothpicks, postage stamps, envelopes, and dental and surgical instruments, etc. Micro-organisms may be carried to the mouth and its adnexa by the action of the ciliated epithelium in the respiratory tract, by coughing, vomiting, hiccough and by the blood and lymph.

*For the drawings in this article I am indebted to Dr. Francis O'vary.

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Robert Koch, in 1876, marked the beginning of modern bacteriology by discovering the causal agent of anthrax, which is probably the best-known and longest studied of all the diseases caused by bacteria.

Bacillus Anthracis.

The infection of man by the Anthrax Bacillus (Fig. 1) usually obtains through some break in the skin, in those who have handled the flesh or skins of animals dying of anthrax. Inoculation of the digestive tract by the ingestion of meat obtained from animals suffering from anthrax, is rare. The infection appears to be possible through the respiratory tract, from dust containing spores of the Bacillus anthracis.

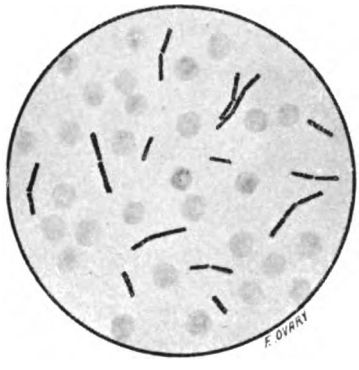


Fig. 1.



Fig. 2.

Fig. 1. Bacillus Anthracis and Erythrocytes from the Blood of a Guinea Pig, Infected by this Bacillus. X 900.

Fig. 2. Bacillus Oedematis Maligni and Leucocytes from the Subcutaneous Tissue of a Guinea Pig Dying from Septicemia Produced by this Bacillus. X 1000.

Anaërobic Micro-organisms of Gangrenous Suppurations.

Bacillus Oedematis.

The Bacillus Oedematis Maligni (Bacillus Septicus) (Fig. 2), is one of the oldest known anaërobic micro-organisms. Pasteur (1877) fixed its morphology and biology and described an acute experimental septicemia resulting from the subcutaneous introduction of this micro-organism into small laboratory animals. Chauveau and Arloing have shown that it is the agent of a fulminating gaseous gangrene in man, and since Koch's work (1881) the name malignant edema has been given this affection.

Within the last few years Veillon and his pupils have given an impetus to the heretofore neglected study of the anaërobic micro-organisms, and as a result there has been discovered in gangrenous lesions a rich flora of these micro-organisms, among which the following principal species are of interest to the dentist and oral surgeon.

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Bacillus Perfringens.

Under the name of Bacillus Perfringens (Fig. 3), Veillon and Zuber (1898) have described an anaërobic micro-organism discovered in gangrenous lesions, which seems to be widely scattered, and has been found in the blood of those suffering from rheumatism, in the myocardium of two patients dying of acute articular rheumatism, in gangrenous suppurations (appendicitis), urinous abscesses, gaseous gangrene, chronic ureteritis, ocular affections, in the putrefying cadaver and in the intestinal tract. This micro-organism is identical with the

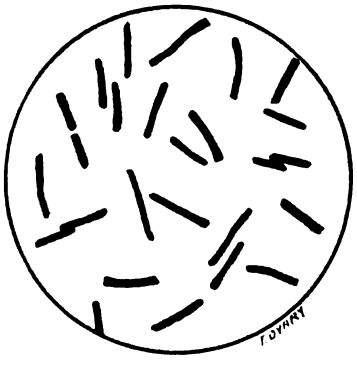


Fig. 3.

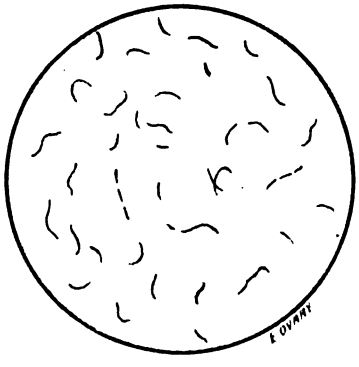


Fig. 4.

Fig. 3. Bacillus Perfringens. (Modified from Besson.) X 1000.
Fig. 4. Bacillus Ramosus. (Veillon and Zuber.)

bacillus described by Achalme (1891) in acute articular rheumatism, and also with the Bacillus aërogenes capsulatus (Welch) found in the organs of a cadaver and the Bacillus phelgmonis emphysematosae isolated by Fränkel in the pus from an abscess.

Bacillus of Ghon and Sachs.

Ghon and Sachs have obtained from the liver of a patient with gaseous gangrene a bacillus resembling the Bacillus perfringens. It is not so thick and at times appears curved and mobile.

Bacillus Pseudo-Oedematis.

The Bacillus Pseudo-Oedematis has been found in the soil (Liborius), in the excrement of animals (San Felice), and appears identical with the Proteus hominis capsulatus described in a case of septicemia in man (Bordoni-Uffreduzzi).

Bacillus Ramosus.

The Bacillus Ramosus (Fig. 4)—identical with a bacillus called Bacillus poeciloides and a bacillus separately described by Lotti and Grigoroff as found by them in cases of appendicitis—exists normally in

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the human intestine, but has been found by Veillon and Zuber in the pus from gangrenous abscesses (otitis, appendicitis, etc.) and by Monnier in dental caries.

Bacillus Serpens.

The Bacillus Serpens (Fig. 5) has been observed in the pus from a mastoid abscess (Veillon and Zuber), and in pulmonary gangrene (Rist and Guillemot). It is identical with the Bacillus radiiformis.

Bacillus Tethoides.

The Bacillus Tethoides (Fig. 6), described by Veillon and Zuber under the name of Bacillus funduliformis, has been found in the vagina and pus of bartholinitis (Hallé), in pulmonary gangrene and the pus from a mastoid abscess (Rist and Guillemot).

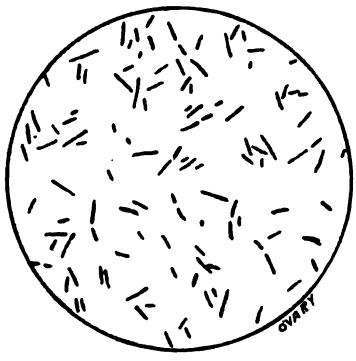


Fig 5.

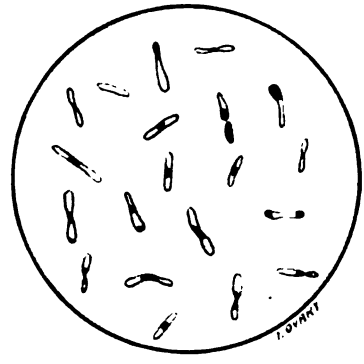


Fig. 6.

Fig. 5. Bacillus Serpens (Bacillus Radiiformis). (Modified from Rist.)
Fig. 6. Bacillus Tethoides. (Modified from Besson.)

Bacillus Fragilis.

The Bacillus Fragilis (Fig. 7), which has been isolated in the pus from a case of appendicitis (Veillon and Zuber), has been found also in the pus of gangrenous appendicitis (Veillon, Zuber, Grigoroff), in periurethral infections (Cottet, Jungano), in pulmonary gangrene (Guillemot), and in dental caries (Monnier).

Bacillus Fusiformis.

The Bacillus Fusiformis (Fig. 8) was discovered by Plaut (1894) and by Bernheim and Vincent (1896) in Plaut-Vincent angina and Vincent, because he had found this micro-organism in nosocomial gangrene, believed it to be the primary cause of that condition.

Willaume, Percy, Richerand, Dupuytren and others had succeeded in producing lesions of nosocomial gangrene, infecting healthy men with material taken from lesions of this disease; and Vincent confirmed these observations by repeating this experiment upon some Arabs and upon himself.

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The Bacillus fusiformis is found abundantly within the pseudo-membranes of gangraena nosocomialis, but is never found in the blood or lymph nodes, and does not invade the tissues of the body. In the lesions it may be alone, but is usually associated with other micro-organisms, such as the Staphylococcus pyogenes, Streptococcus pyogenes, Proteus vulgaris, Bacillus pyocyaneus, Bacillus coli, and the Bacillus of Friedländer. The micro-organism most frequently associated with this bacillus (40 times in 47 cases examined) is a spirillum (Fig. 8) (Spirochaeta of Vincent or the Spirochaeta gangraenae nosocomialis). Vincent found the Bacillus fusiformis not only in the Plaut-Vincent

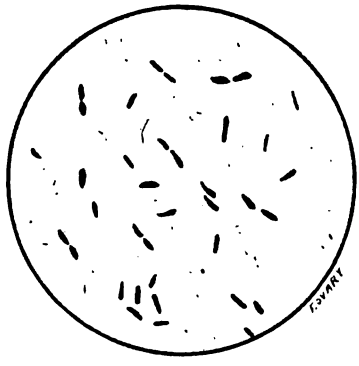


Fig. 7.

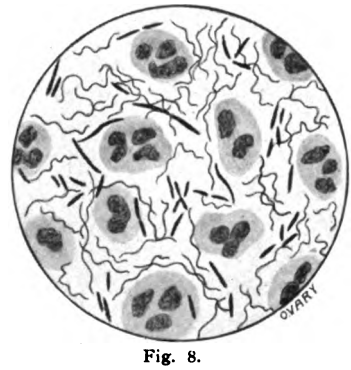


Fig. 8.

Fig. 7. Bacillus Fragilis. (Modified from Besson.) X 1000.
Fig. 8. Bacillus Fusiformis, Spirochaeta of Vincent or Spirochaeta Gangraena Nosocomialis and Leucocytes. X 1000.

angina, but also in some diphtheroid and ulcero-membranous stomatitides. In the diphtheroid stomatitis, the Bacillus fusiformis of Vincent is said to be accompanied by different saprophytic micro-organisms, but in the ulcero-membranous form a spirillum is associated with it. The researches of Vincent have been confirmed by Bertheim, Raoult and Thiry, Abel, Panoff and Letulle. The Bacillus fusiformis has been discovered in appendicitis by Veillon and Zuber, and later by Grigoroff and Perrone, in gangrenous laryngitis by Bernheim and Pospischill, in fetid bronchitis by Silberschmidt, and in noma by Freimuth and Petruschky, Passini and Leiner, and it is similar to the Bacillus hastilis, found by Zeitz in the crypts of the tonsils. Mühlens, von Ellermann, Repaci, Tunnicliff and Weaver have found the Bacillus fusiformis in the healthy mouth and in tartar. The Bacillus fusiformis, together with coarser spirochaetae, has been found next to the teeth, especially the molar teeth, of healthy persons under the gum margin, in carious teeth, in the lesions of ulcerated and mercurial stomatitis, in gangrenous chancres, in moist diphtheritic mucous patches and in gangrenous ulcers of the leg. The

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administration of mercury seems to favor the development in the mouth of these micro-organisms, viz., the Vincent bacilli and accompanying spirochaetae, while salvarsan hinders it. The Bacillus fusiformis is immobile and fusiform. Smears made from the false membranes of the angina and colored with fuchsin or Nicolle's gentian violet show the bacilli to be 5 to 12 micra long, .6 to .8 of a micron thick, rectilinear, at times slightly curved and even in the form of an elongated S. This bacillus has thin rounded ends, which give it its fusiform characteristic, and which thereby causes it to differ from the form of the Bacillus oedematis maligni (Fig. 2), which has sharply cut ends. Many of these micro-organisms appear in pairs, and in mild cases 20 to 30 of them are found in a preparation; in severe cases they vary in number with the gravity of the case, and are usually associated with other micro-organisms. In wounds which have been treated with antiseptics numerous involution forms are found, viz., vacuolated bacilli with spindle ends and cut-out edges, and elongated forms with well-colored constrictions and uncolored swellings. The Bacillus of Vincent is easily colored by basic aniline dyes and particularly by fuchsin and gentian violet. Those which have been colored by methylene blue fix the coloring matter irregularly and present irregular shaped vacuoles, which are evidently not spores, as they do not stain like spores. Different authors give numerous diverging opinions upon the several characteristics of this Bacillus fusiformis. Most investigators consider it immobile (Vincent, von Ellermann, Mühlens, Weaver and Tunnicliff); Letulle says it moves in the saliva; Vespremy that it has cilia, and Plaut that it has numerous fine cilia forming a halo around it, resembling a layer of cotton. Contrary to most bacteriologists, Plaut states that the Bacillus of Vincent is stained by Gram's method and he is supported in this by Jungano and Distaso. The variations in the morphology of the Bacillus of Vincent convinces von Ellermann that there are several species of it (three types). Silberschmidt, however, considers the bacillus as only a growing form of certain spirochaetae.

According to B. Lipschütz, the relative number of these fusiform bacilli to spirochaetae varies greatly in a Plaut-Vincent angina, nosocomial gangrene, etc., and the relationship between these two micro-organisms is symbiotic and not genetic, because when the attempt is made to cultivate them at the same time upon the same culture medium, colonies of the Bacillus fusiformis appear in two or three days, whereas the colonies of the spirochaetae appear several days later, and, further, the Bacillus fusiformis is avirulent to animals, and in lesions of nosocomial gangrene this bacillus is found only upon the surface of the lesion, indicating thereby that it is saprophytic and non-parasitic. Therefore the

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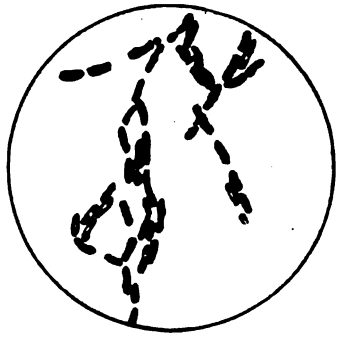
supposition is advanced that the Spirochaeta gangraenae nosocomialis and Spirochaeta of Vincent (the two being thought by some as identical) are the causal agents of these several gangrenous lesions, and that the Bacillus fusiformis plays but a commensal part, resembling the rôle which the Streptococcus pyogenes plays in some epidemics of variola.

Spirillum Nigrum.

The Spirillum Nigrum (Fig. 9) has been found in the pus of appendicitis (Veillon and Zuber), in pulmonary gangrene (Guillemot), and in some cases of infections of the urinary apparatus (Cottet and Jungano), and in the mouth of nursing children (Micrococcus gazogenes alcalescens of Lewkowicz).



Fig. 9.



Fiy. 10.

Fig. 9. Spirillum Nigrum. (Modified from Besson.) X 1000.

Fig. 10. Bacillus Septicus Aërobius. (Legros.)

Micrococcus Foetidus.

The Micrococcus Foetidus has been seen in the pus from gangrenous processes (Veillon), in suppurations from the ear (Rist), in pulmonary gangrene (Guillemot and Cottet), in puerperal infection (Jeannin), and in the vagina and pus from bartholinitis (Hallé).

Herter states that "it is probably safe to assume that in the mouth the free presence of oxygen constantly acts as a deterrent to anaërobic growth. In spite of this, however, anaërobic life is possible, and the indications are accumulating which point to the important part played by anaërobes in setting up pathological states in the mouth. Caries of the teeth, which was formerly referred to aërobic bacterial action, seems clearly the result of the invasive action of the anaërobes on the tooth pulp. In certain derangements of digestion I have noticed that butyric acid fermentation or putrefaction takes place with great rapidity in the food particles that have lodged between the teeth, especially if carbohydrate food has been taken. It must be admitted that proof is wanting

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that butyric acid formation in the mouth is always due to anaërobes. The growth of anaërobes in the mouth is favored by want of cleanliness there, since the accumulation of food masses encourages anaërobic conditions beneath the surface. Probably the intelligent use of the tooth brush is a most potent means of discouraging anaërobic growth in the mouth. In removing decomposing food masses, one not merely admits air to the anaërobes, but also removes many aërobes, which, through symbiotic action, facilitate the multiplication of the former." Pasteur pointed out the fact that anaërobic micro-organisms would grow in a medium containing oxygen, if aërobes were present, as the latter removed the oxygen from the medium.

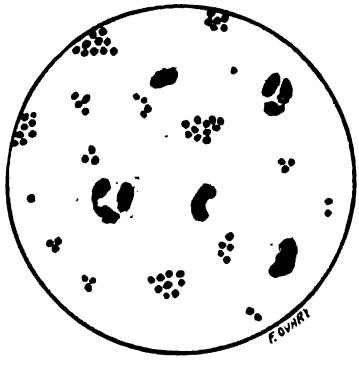


Fig. 11.

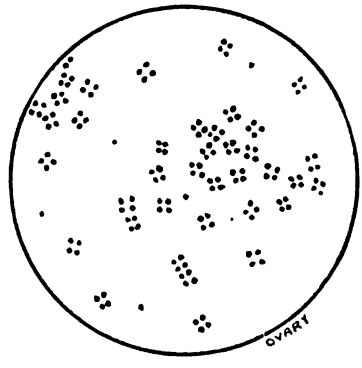


Fig. 12.

Fig. 11. Staphylococcus Pyogenes and Leucocytes. X 1000.
Fig. 12. Micrococcus Tetragenus. X 900.

An Aërobic Micro-organism of Gangrenous Suppuration.

Legros has observed two cases of gaseous gangrene in man caused by an aërobic bacillus, which he described under the name of Bacillus Septicus Aërobius (Fig. 10). Mauté has observed the same micro-organism associated with the Streptococcus and Staphylococcus in a case of puerperal fever and appendicitis.

Staphylococcus Pyogenes.

The three Staphylococci Pyogenes (Fig. 11) differ only in the color of their cultures, and accordingly are separately described as Aureus, Albus and Citreus. Their biological properties are the same. According to Rodet and Courmont there are three variants of the same species, and we shall therefore take the Staphylococcus Pyogenes Aureus (Pasteur), which was the first discovered, as the type. This micro-organism is widely distributed in nature, being found in the air, in certain waters, on the surface of the skin, on mucous membranes, in the ali-

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mentary tract and under the nails. It is constantly met with in the buccal cavity, and is probably the same micro-organism as that described by Biondi under the name of the Micrococcus salivarius pyogenes aureus. It is also frequently found in pus, particularly in furuncles and osteomyelitis, in abscesses and in the exudate of pleurisy, pericarditis, peritonitis and ulcerative endocarditis. It causes certain forms of rhinitis, pharyngitis, bronchitis and broncho-pneumonia. At times it passes into the blood and produces pyemia. It is frequently associated with the tubercle bacillus in inflammations of the pleura or meninges. It complicates trichophytinous diseases; is often associated with the Pneumococcus in pneumonia and the Klebs-Löffler bacillus in diphtheria. It favors the development of the Bacillus of Vincent (Vincent), the Bacillus of influenza (Grassberger) and spores in the Bacillus oedematis maligni (Besson).

Welch has discovered what he thinks is a feebly pathogenic form of the Staphylococcus pyogenes albus, the Staphylococcus epidermidis albus, which he says may cause suppuration and which appears to be present habitually on the surface of the skin and in the deeper part of its malpighian layer. It is thought that this micro-organism in the epidermis may develop under certain conditions, viz., when cat-gut sutures are tightly drawn, and thus cause a skin abscess.

Micrococcus Tetragenus.

The Micrococcus Tetragenus (Fig. 12) was first pointed out in the pus from a cavity in the lung. It is a saprophytic micro-organism disseminated in the air and on the surface of the skin; is met with in the saliva, stomach and nasal mucus of healthy subjects; may become pathogenic and is frequently associated with the tubercle bacillus in pulmonary tuberculosis. It causes pharyngitis, different forms of suppuration (empyema, adenitis, meningitis, furuncles, dental abscess and sometimes septicemia).

The Streptococcus.

Pasteur and Doléris discovered the Streptococcus (Fig. 13) in the blood of patients having puerperal fever. This micro-organism causes many forms of suppuration; puerperal fever, phlebitis, purulent surgical infections, certain forms of broncho-pneumonia, empyema, peritonitis, meningitis, endocarditis, salpingitis, otitis, dermatitis, osteomyelitis and erysipelas (Fehleisen). In all forms of pharyngitis, of whatever nature, the Streptococcus is met with either as the dominant micro-organism or as an associate (Prudden, Raskin, Lemoine, Weaver, Cumpston). That the Streptococcus is not the causal agent of scarlatina is generally admitted to-day, yet it is almost constantly found in this disease and causes a great number of complications (Combemale and Lamy, Babès Raskin, Kurth), and may be considered as the micro-organism of secondary in-

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fection. Hektoen has found it 12 times in 100 in the blood of scarlatina patients, and it is almost always encountered in their throat (Weaver). The Streptococcus is still more to be dreaded when it associates itself with certain pathogenic micro-organisms and enters the scene of the disease as a secondary infection because it appears to exalt the virulence of the micro-organisms to which it is added. It has been found associated with the Bacillus of influenza (Vaillard and Vincent, Ribbert, Weichselbaum, Chantemesse and Widal), of typhoid fever (Vincent), of diphtheria (Löffler, von Behring, Roux and Martin), and with the Pneumococcus, the

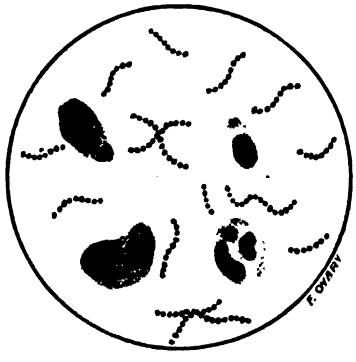


Fig. 18. Streptococcus and Leucocytes. X 1000.

Bacillus tuberculosis and the Bacillus fusiformis of Vincent. It is met with in the healthy individual on the surface of the skin, in the mouth, nose, alimentary tract and rarely in the vagina. It is found in the air, soil and well-water, but seems to lose its virulence very rapidly outside of the body. The multiplicity of morbid processes caused by the Streptococcus and its presence in the healthy human body as a saprophytic micro-organism have attracted for a long time the attention of bacteriologists, and some are inclined to admit the existence of at least two species: the Streptococcus pyogenes of Rosenbach and the Streptococcus erysipelatis of Fehleisen. The morphology of the micro-organism affords arguments in favor of the existence of several types, as a Streptococcus tenuis, brevis and longus can be differentiated. Schottmüller, basing his classification of streptococci upon the different biological manifestations upon human blood agar, describes the following types: (1) Streptococcus longus pyogenes, or erysipelatos; (2) Streptococcus mitior, or viridans; (3) Streptococcus mucosus. Another school of bacteriologists, under the leadership of Marmorek and Aronson, have returned to the unicist theory, that the Streptococcus is only a single species, but is able to cause different morbid conditions.

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Accordingly, the saprophytic Streptococcus is not to be differentiated from the pathogenic Streptococcus, and in the healthy human body, under the influence of certain extraneous causes, as traumatism, cold, or the association with other micro-organisms, it may become pathogenic. It seems, therefore, to be less confusing to admit with most bacteriologists that there are for the Streptococcus, as for the Spirillum cholerae, several strains (Denys, Tavel, Moser, Paltauf). It is extremely difficult to single these out. The number of strains of the Streptococcus is still one of the most controverted questions in bacteriology. Petruschky has shown that the same Streptococcus can cause indifferently an erysipelas, an abscess, or septicemia in a man or animal.

McFarland, citing the experiments of Welch, Robb and Ghriskey, upon hand disinfection, says: "These observers have shown that no matter how rigid the disinfection of the patient's skin, the cleansing of the operator's hands, the sterilization of the instruments and the precautions exercised, a certain number of wounds in which sutures are employed will always suppurate, the cause of the suppuration being the skin cocci, all of which it is impossible to remove. We thus carry infectious organisms constantly with us upon our skins, and so pave the way for suppuration in wounds. That all wounds do not suppurate probably depends largely upon the local and general immunity of the individual rather than upon the absence of organisms from the wounds."

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The Physiological and Pathological Resorption of Tooth Roots.

By Rodrigues Ottolengui, M.D.S., D.D.S., LL.D., New York.

Read before the American Society of Orthodontists at Chicago, July, 1913.

Late in the spring of 1908 a girl of eleven was placed in my care for the correction of malocclusion. The jaws were extremely small, narrow, and the upper arch marked V-shaped. The upper temporary laterals had been prematurely lost, with the result that the first bicuspids were in close proximity to the lateral incisors. The case belonged to Class I of the Angle classification. The routine of slowly widening the arches, and recovering the spaces needed for the cuspids was undertaken, but was necessarily carried on with extreme caution because of the ease with which the teeth could be moved, or rather tipped. I could recount the many difficulties met with in this case, and I am sure they would be interesting, as this is one of the records of failure for which the president of last year made a plea. But as the immortal Kipling has said "that is another story."

The story which I bring you to-day is of far greater importance than the mere history of a failure.

Treatment was carried on with short periods of rest until early in June of 1910, actual treatment exclusive of retention having covered about twelve months. Retainers were placed, and the case dismissed until the autumn. Early in October the patient returned for resumption of her treatment, and as there was still no signs of the eruption of the cuspids, though room had been made for both of them, the girl was sent to Dr. Schamberg for radiographic investigation, and here beginneth the real narrative. Dr. Schamberg called me up on the telephone and

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said: "The cuspids are both present, but I have sad news for you. The roots of the incisors are being resorbed." I was somewhat stunned, and I think that those of you who have never had a similar experience will share my feelings when you see the radiographs.

Fig. 1* is from the left side, and shows the cuspid pointing between the lateral and central, with a typical resorption of the lateral root, and by typical I mean as compared with similar resorption of a temporary

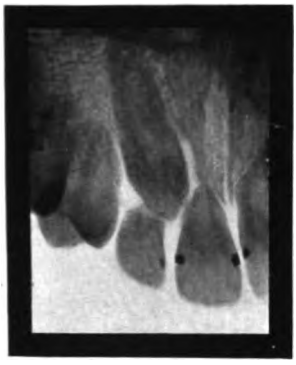


Fig. 1 (Schamberg).



Fig. 2 (Schamberg).



Fig. 3 (Schamberg).

tooth where we see it in connection with an almost erupted successor. Or, in other words, were this permanent lateral a temporary cuspid, we would expect the resorption of the tooth root to appear as it does in this picture. The permanent central, however, is somewhat different, and in the absence of other pictures we would hesitate to decide whether this root had been resorbed, or whether it had never been fully formed.

Fig. 2 shows us the right side. Here we find the cuspid erupting between the lateral and the bicuspid, and this leaves us more than before, in doubt as to whether the shortness of the central root is due to resorption, or to lack of development.

In Fig. 3 we see the two central incisors, and the roots appear so short that it is difficult to believe that they never have been any longer. I could not doubt the fact that I was in the presence of a condition new to me, and so far as I knew, heretofore unreported in the literature. I had seen radiographs of cases where erupting third molars had caused resorption of the distal roots of the second molars, and by analogy I could comprehend the resorption of these lateral roots, and even of the

*I am indebted to Drs. M. I Schamberg of New York, Sidney Lange of Cincinnati, and F. T. Van Woert of Brooklyn for radiographs. The name under each illustration will indicate the maker of the original radiographs.—R. Ottolengui.

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root of the left central, but the resorption of the root of the right central was, and I may add, still is, a mystery to me.

It may be of interest to relate that during that winter I sent these radiographs to a number of radiographers, and received quite conflicting views. The patient's regular dentist declared that he did not think the pictures showed conclusively that the roots were resorbed. He pointed out that the cuspids might be sufficiently lingual or labial of the other teeth to erupt without causing traumatic injuries, and that these four incisors might eventually develop greater length of root. At least one



Fig. 4 (Ottolengui).



Fig. 5 (Ottolengui).

radiographer advanced the same view as a possibility, and though I did not believe it, I felt obliged to give the child the benefit of the doubt. I did not care, however, to risk any further stress upon these teeth, and so treatment was delayed awaiting the pointing of one or both cuspids.

In September, 1912, the patient reported for examination, the left cuspid pointing through the labial gum, high up, and in slight torsion.

Fig. 4 shows the condition on the left side at that time. The lateral root has entirely disappeared, and though the central root does not appear to have diminished in size, the direction and close proximity of the oncoming cuspid was a menace to the central, and consequently the permanent lateral was extracted, and orthodontic interference immediately inaugurated. I have the extracted lateral, and it may interest you to examine it and to note how exactly like a shed deciduous tooth it appears.

Fig. 5 shows the right side at the same period. The lateral root shows progression of the resorption, while the central does not appear much altered. Unlike the left cuspid, this tooth will evidently point lingually. This is a point of interest, because here we have a case in which one cuspid erupts in a path slightly labial of normal, and the other slightly lingual of normal, and yet we find a destruction of the

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tooth ahead of it in both instances. Nor does the fact that the right cuspid lies lingual of normal seem to have saved the root of the central incisor on that side, which has resorbed despite of the fact that a tooth intervenes on each side of it, between its own root and the oncoming cuspids.

During the past winter the cuspid on the left side was moved away from the central incisor and down into position. Fig. 6 shows the condition on March 19, 1913. The shadows of the cuspid and bicuspid



Fig. 6 (Ottolengui).



Fig. 7 (Ottolengui).

overlap so that the picture is slightly confusing, but shows definitely that the cuspid has been moved clear of the central. The cuspid on the right side has not as yet pointed. Fig. 7 shows the condition on the right side at the same date. The roots appear somewhat longer than in the previous pictures, but this is undoubtedly due to distortion.

Resorptions Differentiated.

In the title of my paper I mention "physiological" and "pathological" resorption of tooth roots. By physiological resorption I mean that resorption of a root which occurs as a part of the normal routine, as when the roots of deciduous teeth resorb to accommodate the erupting successor. There is one marked clinical fact to be noted in regard to physiological resorption, and that is that the pulp of the deciduous tooth, though shortened with the root, remains alive.

By pathological resorption I mean a resorption inaugurated by some outside interference with the normal routine. There are several distinct kinds of pathological resorption, which are accompanied by clinical aspects, which are fairly constant when studied with the X-ray.

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Let me pause here to make a statement. I am not counting myself as an histologist in this discussion. Indeed, I admit freely that I do not really comprehend the histology of these conditions, but, then, I may add with all deference, that judging by what they have written, the histologists themselves are not absolutely sure of their ground. In the main, these problems have heretofore been studied in the laboratory and with the microscope. I am bringing you such evidence as I have been able to collect with the aid of the X-ray and radiographers, and as some of

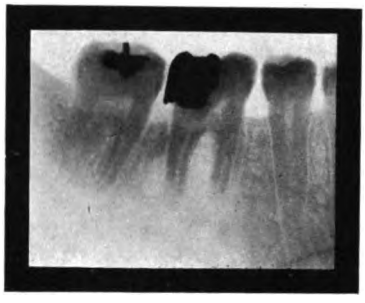


Fig. 8 (Schamberg).



Fig. 9 (Schamberg).

this evidence seems to be in conflict with the expressed views of the histologists, and as I am recording the history of an unusual and heretofore unrecorded condition, I am hoping that the histologists will once more take up this study, and perhaps by combined effort bring some order out of the present chaos.

Asking your pardon for this digression, which seemed necessary, let us return to the subject.

Pathological Resorption.

A common variety of pathological resorption is that found in connection with infections.

Fig. 8 shows resorption of the ends of the roots of a molar. This is pathological resorption due to alveolar abscess, the pulp dying prior to the beginning of the resorption.

Fig. 9 is a picture for which I am deeply grateful to Dr. Schamberg, who supplied me with this and the previous radiograph. This particular picture is of great interest because here we have extensive resorption of three roots, undoubtedly pathological in character, the resorption having been caused by a tumor, which has destroyed the roots and the pulps of a lower central, lateral, and cuspid. This picture serves well as a basis

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of comparison when considering the case already presented, and others to be shown, in which the roots of several teeth have been resorbed. In this tumor case we know that we are in the presence of a pathological condition, whereas in the others we are in doubt, and I may call your special attention to certain facts. In the doubtful cases, including the first one presented, the pulps remain alive, and as fast as the roots have resorbed, the alveolar bone has been rebuilded. Speaking broadly, we have there an osteoclastic action destroying the tooth root, rapidly followed by an osteoblastic action, which fills in the space in the alveolar bone which would otherwise be left by the destruction of the tooth root, if this bone building did not occur. It is also to this phenomenon that we may attribute the firmness with which the partly resorbed teeth are attached, the resorbed portions being in effect held by bony anchylosis just as implanted teeth are held, as will be presently shown.

Thus we find in the pictures of the first case presented that, though the roots of the teeth have been resorbed, the alveolar bone appears normally intact.

Quite the contrary is true in the pathologic cases; not only are the pulps dead, whether they die first and cause the abscess and resorption, or whether they die because of the resorption and infection from the tumor, but also we find that the same energy, whatever it is that destroys the tooth root, likewise destroys the alveolar bone, as is plainly seen in the two illustrations, Figs. 8 and 9.

Another type of pathological resorption may be called traumatic, and at first would appear to be closely analogous to the special condition under consideration.

I have known cases where an erupting third molar has caused resorption at the distal aspect of the second permanent molar. I regret exceedingly that I have no such picture to show you, but I shall earnestly endeavor to obtain one before publication. The point of interest, however, is that in these cases the resorption continues until the pulps become affected and die. I should like to see myself, and to have for your comparison, pictures of such cases in order to study the appearances of the alveolar bone, so that we may see whether the destruction is confined to the tooth root or includes the alveolus.

Implanted Teeth.

The clinical or radiographic picture of resorption occurring after the death of a pulp, we have seen in Fig. 8, where we noted that there is also a destruction of the surrounding alveolus. But there is one more type of resorption, that which occurs about an implanted tooth. For some years after the inception of the operation of implanta-

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tion there was much discussion as to how such teeth are retained. There is little doubt, however, that the rotation of events is about as follows: Whether the socket be a drilled socket, or an old socket reamed larger, we have a traumatic injury, to repair which an osteoblastic action is set up. If no tooth were implanted this reparative process would continue until the socket were completely filled in. By introducing a root of another tooth we bring into position a foreign body, and nature at once attempts to evict the intruder. Osteoclasts appear and attack the root.



Fig. 10 (Ottolengui)

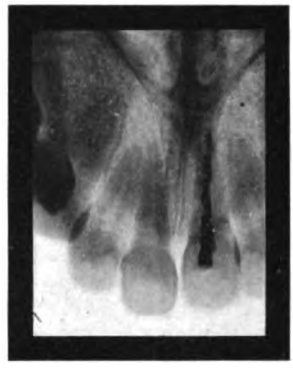


Fig 11 (Ottolengui).

Where the implanted member becomes firm it is due to the fact that the osteoblastic has overcome the osteoclastic action. The osteoclasts have eaten bays into the cementum, and the osteoblasts have builded bone therein, so that anchylosis occurs.

Fig. 10 shows the root of a tooth implanted by myself, and was taken one year after the operation. A comparison with the roots of the teeth adjacent shows how different is the attachment. In the adjacent lateral and central we see the space around the root caused by the presence of the pericementum, and we note the clean, smooth appearance of the roots. In the implanted tooth we see the pericemental space bridged across with bone, and the entire tooth root roughened.

Fig. 11 is from another implanted tooth, taken about two years after replantation. Perhaps I should say, to be accurate, that both these teeth were replanted teeth, having been accidentally knocked out. This particular case was implanted by another dentist, and the root filling, of course, is his. The patient is in my care at present and I made the radiograph partly to record existing conditions, and partly for use in this discussion. Here we note even more clearly than in the other case the retention by bony union, and we learn that osteoclastic action may

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be so closely followed by osteoblastic that a root may be held fast though partly resorbed.

Here, again, we have a condition not entirely analogous with that to which I am specially calling your attention. We are dealing here with a non-vital root, and one which is an intruder whether replanted or implanted. Moreover, we must note that the destructive action attacks all surfaces at once, and does not begin at the apex and proceed toward the tooth crown. The osteoblastic action in one case is entirely behind the tooth root, and in the other it surrounds it. But there is another



Fig. 12 (Schamberg).

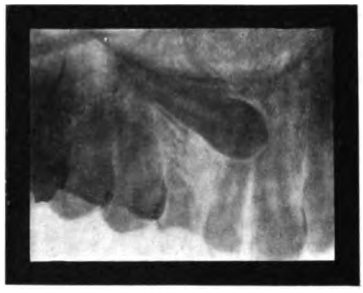


Fig. 13 (Lange).

condition still, which I also regret my inability to show you, but which I hope to obtain.

Where an implanted or replanted tooth has once become firm, some traumatic or other cause may inaugurate a new resorptive action. This will have its origin at the apex of the root and will proceed toward the crown exactly as we see the deciduous teeth resorb, until finally it is held so slightly that it is loosened and is either exfoliated or extracted. It would be interesting to have pictures of such teeth and note the appearance of the surrounding bone during this destructive action.

Problematic Influences of Erupting Teeth.

Coming back to our original problem, we must ask ourselves "what has caused the resorption of the roots of the four incisors?" It would relieve us immensely, could we be sure that the advancing cuspids have inaugurated the trouble, but we have objections to meet with this hypothesis. One is that in similar conditions in the third molar region the pulps die; a second is that we see so many similar conditions without resorption of the permanent teeth that are in the paths of those erupting abnormally, that we would be compelled to

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explain the further problem, "why does the advancing cuspid cause resorption in some cases and not in others?" Lastly, and more important, I will presently show you similar resorptions where the permanent cuspid is congenitally absent.

Fig. 12 is an excellent radiograph, in which we see a malposed cuspid erupting without damage to the permanent teeth, since we see the outlines of the lateral and central roots showing through the shadows of the cuspid.

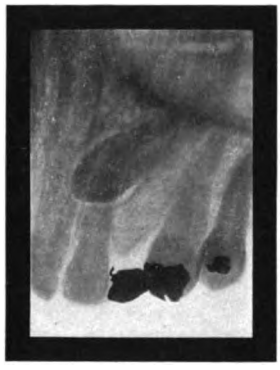


Fig. 14 (Lange).

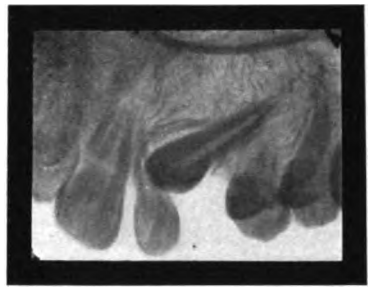


Fig. 15 (Lange).

Fig. 13 is a similar condition. As touching on another phase of this subject to which I have yet to come, please observe that the root of the deciduous cuspid is almost completely resorbed, despite the fact that the cuspid is quite distant and advancing in another direction, whereas the lateral and central which appear in its path are intact.

Fig. 14. A similar case also shows no injury to the lateral.

Fig. 15 is of the same character.

Fig. 16, supplied by Dr. Schamberg, is somewhat different. The cuspid is approaching in a fairly normal manner, except that it is mesial of normal: the root of the temporary cuspid is somewhat resorbed so that if the advancing cuspid has the power to resorb a tooth root we may question why it has apparently been deflected from its path, when it should have destroyed the temporary cuspid root and taken its proper place? We again note that the lateral which is in the path of the cuspid is intact, but the apex of the central shows trouble of some character Here, however, if I read signs aright the resorption, if any exists, is clearly pathological, the alveolus being involved. However, the radiograph is not very good and a diagnosis in regard to the central is not dependable.

In regard to Fig. 17, however, we have no doubt. I regret that I

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do not have the history of this case, also from Dr. Schamberg, but whatever it be, here we note the reverse of Fig 13. Here, once more, the deciduous cuspid root has resorbed, although distant from the path of the cuspid. The cuspid seems to have completely ignored the lateral root in passing, whereas the root of the central has totally disappeared. It is just as difficult to explain why the lateral has escaped, as to declare that the central has been destroyed by the cuspid. These be two horns of a dilemma.

Thus we find that though the resorption of the roots of the four



Fig. 16 (Schamberg).



Fig. 17 (Schamberg).

teeth in the case first presented might naturally be considered as pathological, nevertheless there is a closer analogy to the resorption of the roots of deciduous teeth, which, of course, is a physiological occurrence. Thus it will not be amiss to spend some time in considering the resorption of deciduous roots.

Resorption of Roots of Deciduous Teeth.

Here we have a normal and constantly recurring sequence of events, which has undoubtedly been studied by many histologists, but we do not find that the scientific gentlemen have as yet arrived at a single and definite explanation of all the phenomena. Perhaps the most widely adopted theory is to the effect that the oncoming permanent tooth is in some way a factor, or cause of the resorption. In regard to the details of this there is a variance of views, some believing that the advancing tooth, or tooth sac, causes pressure which inaugurates the resorption. One argument is to the effect that the resorption of the deciduous tooth will start at the point nearest to the advancing tooth and that it will proceed in the direction of the long axis of the path of the oncomer. Pictures which I will show fit this view very well, but they

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Fig. 18 (Schamberg).



Fig. 19 (Van Woert).



Fig. 20 (Van Woert).



Fig 21 (Lange).

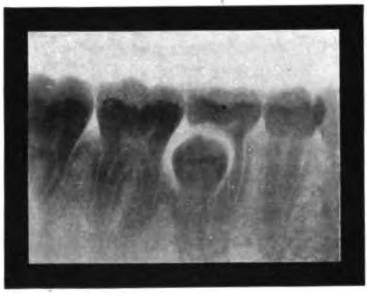


Fig. 22 (Lange).



Fig. 23 (Schamberg).

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fit equally well with quite an opposite theory, which is that the part of the deciduous root which resists resorption deflects and so alters the direction of approach of the erupting tooth. Another view is to the effect that the sac of the erupting tooth generates a "resorptive organ" which is the destroying agent. Were this true we could understand the destruction of any root impeding the arrival of the new member, whether deciduous or permanent. But were this explanation correct we would be at a loss to comprehend such conditions as seen in the last illustration (Fig. 17), where a deciduous tooth distant from the advancing cuspid shows resorption, while the lateral incisor directly in its path has escaped, and the central incisor which it is just reaching has completely lost its root.

Fig. 18 is a perfectly normal condition. The deciduous tooth is losing its root, and the bicuspid is, as it were, arriving on time. Were this constant there would be no difficulty in solving the problem, except, indeed, that one theory would fit the facts as well as another, which, of course, would lead us no nearer to a final knowledge than we are at present.

Fig. 19 is similar and shows such a state of affairs as would result if the tooth in the last picture should continue to advance and its predecessor to resorb. At this time the roots have disappeared and the deciduous crown is about to be shed.

Fig. 20 brings us face to face with an early stage of one of our orthodontic problems. Is this deciduous root resorbed as it is because of the false direction of the bicuspid, or has the resistance to resorption. or let us say, assymetrical resorption, caused a deflection of the bicuspid? Gentlemen, this is a question of importance to us, because a knowledge of the truth would aid us mightily in deciding when to extract the deciduous tooth.

The Author's Views upon Resorption of Deciduous Roots.

And now I shall enter upon the dangerous hazzard of expressing my own views. If the histologists all agreed upon this matter I should not venture, but since they are at variance one more theory can scarcely befog the issue much.

As the latest American work on histology is from our well-known and much-admired Dr. Fred'k Noyes, I very naturally consulted his book, hoping to obtain his views upon this subject, but in this I failed. He gives us some beautiful microscopic pictures of sections showing dentition at various stages, but unless I have overlooked it, there is nothing explaining the resorption of the deciduous roots. In speaking of the eruption of the deciduous teeth themselves, however, I find this statement:

"Usually, somewhere between the seventh and ninth months after

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Fig. 24 (Schamberg).



Fig. 25 (Schamberg).

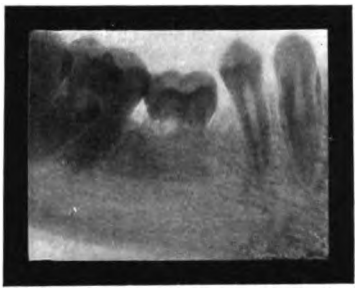


Fig. 26 (Lange).

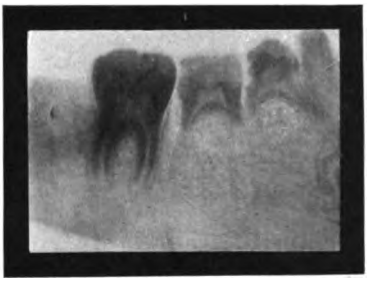


Fig. 27 (Lange).

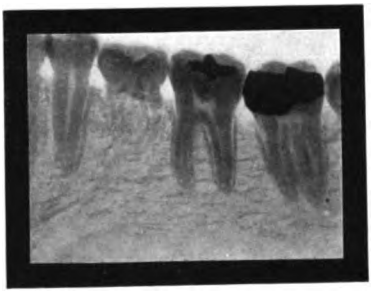


Fig. 28 (Lange).

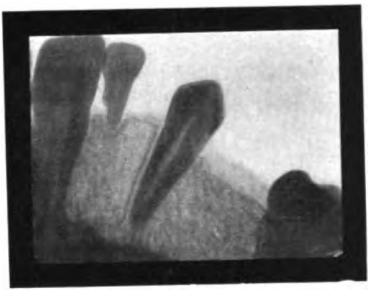


Fig. 29 (Lange).

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birth, the growth of the central incisors causes the absorption of the roof of their crypts, and the tooth moves occlusally, cutting through the "soft tissues." The author does not tell us in detail how the advancing tooth absorbs the roof of its crypt, but he says it is the result of growth, and speaking of growth, elsewhere he tells us that growth creates a force, which he calls "growth force." He says that this "force" is "the result of the multiplication of cells of the tooth germ, and is exactly comparable to forces exerted by the multiplication of cells in any position." Then he continues and says: "For instance, the force exerted by the multiplication of the cells of a rootlet of a plant is sufficient to force pebbles aside and make an opening through hard-packed earth."

After this he practically tells us that all bone growth is dependent upon this "growth force."

All this is beautiful in theory, and, moreover, it may be true, and yet it does not appeal to me as logical, though I admit it may be histological. I do not mean to imply that the multiplication of cells does to create a force. This is proven by the simile of the rootlet moving earth and pebbles aside, but that the stress exerted by this force influences growth elsewhere or in adjacent tissues, does not appeal to me. Moreover, let me point out that the growing vegetable root thrusting aside pebbles is not exactly analogous with the growth of a tooth root which is surrounded by living tissues. It seems to me that these living tissues are not moved by the force of the multiplying cells of the tooth germ, but that they move or grow, as the case may be, energized by forces within, rather than without themselves, and in obedience to the mysterious law which causes all cells or aggregations of cells to aim at the production of type.

Without going into histology, or biological chemistry, which I am quite satisfied to leave to the specialists in those fields, I believe that the resorption of the roots of deciduous teeth is in no physical sense dependent upon the eruption of the successor. I believe that the resorption of the deciduous root is merely a fixed step in the normal plan. The law which governs the development of the individual demands that he shall have two sets of teeth. As stages of this routine the crowns of the deciduous teeth are formed and then their roots. In due season, these roots resorb, not because of any influence exerted by the oncoming tooth, but because they must be removed out of the way, that the advancing tooth may arrive. In other words, it is a retrogressive metamorphosis, which is just as vital to the plan, as was the original building up of the tooth. If this be true, then it would follow that in the regular order, the roots of deciduous teeth could, and often would, resorb in spite of the fact that no permanent tooth germ were underlying it, and this is exactly

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what does occur, as I shall abundantly show you. In support of the view that the deciduous roots are resorbed by pressure or growth force, if you wish to call it that, exerted by the oncoming tooth (I am using Dr. Noyes's expression, but he has not said this. I merely adapt his phraseology to a general belief), it has been pointed out that in a strictly normal cycle the resorption of the roots of a deciduous molar will assume the form and fit as a matrix over the bicuspid tooth. But this clinical fact quite as well fits in with my theory, and I believe that this co-adaptation is a fortuitous circumstance rather than a result consequent upon the presence of the bicuspid. Consider for a moment! Nature has ever found the best method of advancing its aims, and an important aim here is that this grinder shall be firmly fixed as long as possible. If the roots of the deciduous molars were resorbed, as are the roots of incisors, the molars would very much more quickly become loosened. But when resorption occurs as it does normally, the destruction occurring along the inner and underside of the roots, it follows that the mesial and distal surfaces of the roots may be retained longer, and the roots thus have a greater length and proportionately greater stability. I think I shall be able to show you resorption of this character, the deciduous root assuming the form of an advancing bicuspid despite the fact that no bicuspid is present.

This brings us to a different reading of the assymetrical resorption of roots. We have still to study out the chemistry of this solution of a tooth root, as well as to consider the destructive agents which are making the attack, most probably osteoclasts, before we can determine why it is that the deciduous root at times does not resorb, or resists resorption. But I leave that also to the histologists, and will merely record the clinical fact that such resistance does exist. And it is my view that when it does occur, this resistance, or persistence of the deciduous root causes a deflection of the permanent tooth. I do not, however, mean that all deflections or misplacements are traceable to this cause, for I have already shown misplaced and badly deflected cuspids, where the resorption of the deciduous teeth was normal.

Fig. 21 is a good illustration of possibilities. The first deciduous molar is resorbing normally, and the bicuspid is arriving normally. The resorption of the second molar is quite normal and symmetrical and yet the bicuspid is arriving abnormally.

In Fig. 22 the picture is quite different. The mesial root of the temporary molar has persisted, and consequently the bicuspid is erupting distal of normal. In this instance it is possible that the distal root of the deciduous molar was also resistant of the resorbtive agent, or else

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Fig. 30 (Lange).



Fig 31 (Lange).



Fig. 32 (Schamberg).

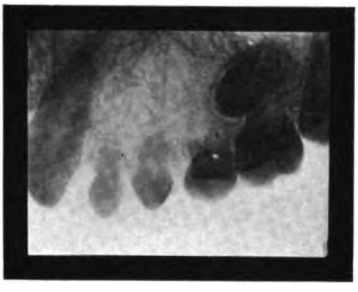


Fig. 33 (Schamberg).

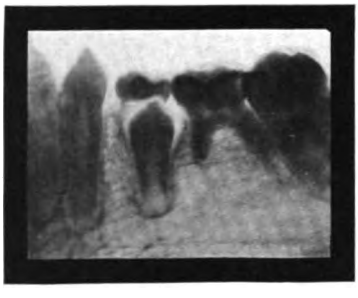


Fig. 34 (Schamberg).



Fig. 35 (Schamberg).

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the agents themselves were inactive, for note here that the bicuspid is still unerrupted, whereas the second permanent molar is in place.

Fig. 23 is practically a duplicate of the last in regard to the bicuspid and the deciduous molar, but here, curiously enough, the second permanent molar appears to be entirely absent. If the tooth has been extracted, it would fix the condition at almost the same period as in the last case. At all events, it shows that such conditions are not uncommon.

Deciduous Roots Resorbed Without Successors.

I said that I could show you cases of resorption of deciduous roots in the absence of permanent successors, and I will now present that evidence.

Fig. 24 shows a deciduous second molar typically resorbed, with no bicuspid present.



Fig. 36 (Lange)

Fig. 25 shows two deciduous molars with roots resorbed, and neither of the bicuspids present.

Fig. 26 shows a deciduous molar resorbed almost to the point of shedding, with no successor.

Fig. 27 shows two deciduous molars with roots resorbed, and no bicuspids present.

Fig. 28. Deciduous molar with roots resorbed and no bicuspid present. I would have you note that this condition seems more often occurring in connection with the second deciduous molar than with the others, at least so far as I have been able to collect radiographs. This condition occurs elsewhere, however, as I shall show.

Fig. 29 shows an upper temporary lateral, resorbed with no permanent lateral present.

Fig. 30 shows another deciduous lateral with root resorbed and no permanent lateral present.

Fig. 31 shows two deciduous lower centrals with roots resorbing and no permanent centrals present. The cuspid [illegible], however, exhibits normal conditions.



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Fig. 37 (Schamberg).



Fig. 38 (Schamberg).



Fig. 39 (Schamberg).

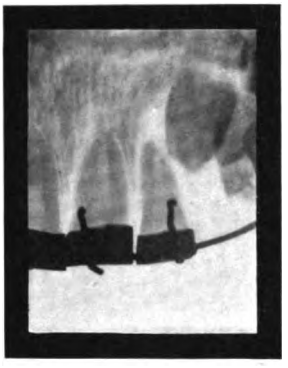


Fig. 40 (Schamberg).



Fig. 41 (Schamberg).

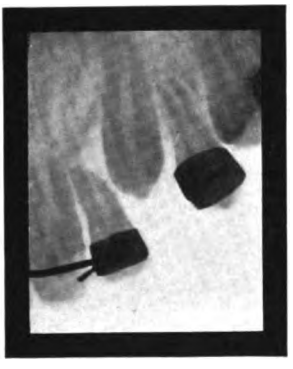


Fig. 42 (Schamberg).

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I will show you now illustrations of a case occurring in my own practice.

Fig. 32 shows the right side in the upper arch and we see the deciduous lateral with root resorbing and no permanent lateral present.

Fig. 33 shows the left side of upper arch of same patient, and we see the deciduous lateral incisor, cuspid and first molar all with the roots resorbed and no permanent successors present.

Fig. 34 is the right side of lower arch of same patient. Conditions are progressing normally in the region of the first bicuspid, but once more we find the second deciduous molar resorbed and no permanent tooth below it.



Fig. 43 (Schamberg).



Fig. 44 (Schamberg).

Fig. 35 is the left lower side of same patient, and now we have both bicuspids absent, yet both deciduous molars are resorbed typically.

I mentioned heretofore that it is possible that resorption of the deciduous tooth may not occur even though the permanent tooth be present. This is exactly the reverse of the conditions which I have been showing, but is an argument in the same direction as it is opposed to the theory that the advancing permanent tooth causes destruction of the tooth which may be an obstacle in its path.

Fig. 36 is an excellent example. Here we note the deciduous cuspid with root untouched by resorption, while the sac of the advancing cuspid is in contact with it.

Views of Dr. Broomell.

In outlying my own theory of the resorption of deciduous tooth roots I avoided the histological explanation thereof, but I can give you the opinion of one well-known histologist, Dr. Broomell, whose views are not contradictory of my own, though more scientific in supply-

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ing detail. I merely state the belief that the resorption of the deciduous tooth roots is not dependent upon any excitation from the permanent successor, and I offer radiographic proof of clinical facts which substantiate this contention. But, unless I misundertood him (his views



Fig. 45 (Schamberg).



Fig. 46 (Schamberg).



Fig. 47 (Schamberg).



Fig. 48 (Schamberg).

were communicated to me orally), he believes that at the opportune time there appears at the apex of each deciduous tooth root what may be called a "resorptive organ," whose office it is to destroy the root, and thus clear a way for the permanent tooth. If this can be demonstrated, then perhaps we may be able to account for the resorptions recorded in connection with the first case, as well as with those that are to follow, which, be it remembered, show more clinical resemblances to the physiological resorptions of deciduous roots than to any of the pathological resorptions which I have described, because the pulps remain living and the alveolus is rebuilt behind the resorption.

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Fig. 49 (Schamberg).



Fig. 50 (Schamberg)



Fig. 51 (Ottolengui).



Fig. 52 (Ottolengui).



Fig. 53 (Ottolengui).



Fig. 54 (Ottolengui).

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Normally man is supposed to have but two sets of teeth, but in sporadic cases we find additional or extra teeth erupting. If it be true that the deciduous teeth are resorbed by a resorptive organ which appears at the apex of the root, is it not within the realm of possibility that a similar condition might occur, as an eccentric act of nature, at the apex of a permanent tooth?

I advance this postulate, but I cannot say that I am quite prepared to adopt it. If my own case were the only one of its kind, I might do so, but, unfortunately, I have found others.

I will now present the radiographic records of four cases, occurring in the practices of Drs. Young and Kemple, and I would like those gentlemen to give us the clinical histories of their cases. The first case, Master B., is a patient of Dr. J. Lowe Young.

Fig. 37 shows the upper right side. The cuspid is seen erupting. The root of the temporary cuspid has resorbed, and we note that there are signs of resorption of the permanent lateral. In this instance the picture is quite like that of traumatic resorption, as the destruction has not involved the apex, but seems to have occurred just in line of the advancing cuspid. I believe, however, that this pulp has remained alive, and this would not be the expectation if the resorption were strictly pathologic. Nevertheless, there is room for argument here. But observe that the apex of the central appears to be affected.

Fig. 38 shows the left side of same case. The lateral root is as yet unaffected, but the central has much the appearance of its mate. These two radiographs were made November 29, 1909. Interference was instituted and radiographs taken February 15, 1910, only forty-seven days later.

Fig. 39 shows the changed position of the teeth on the right side and no noticeable difference in the appearance of the affected roots.

Fig. 40, however, of the left side discloses that the apex of the lateral incisor has been considerably shortened. The next radiographs were made on October 12, 1910.

Fig. 41 shows the cuspid erupting nicely, with the lateral and central about as before.

Fig. 42 shows the left side, taken at the same time. The final radiographs were made on June 12, 1912.

Fig. 43 shows the right side, with new bone apparently built into the resorbed portion of the lateral root.

Fig. 44 shows the left side. Candor compels me to point out that there is no certainty that the central incisor roots have been resorbed. They do not appear normal, but, then, perhaps they never have been normal. We know, however, that the lateral incisor roots have suffered,

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and it is possible that in this case the resorption of the laterals has been due entirely to the advance of the cuspids, yet it is strange that the pulps should have remained alive.

The next case, Miss C., is also a patient of Dr. Young's.

Fig. 45, from a radiograph made October 26, 1909, shows the left side of the upper arch, and we see a cuspid crowding into place. Apparently there has already been some resorption of the lateral incisor.

Fig. 46 shows the condition on January 11, 1910.

Fig. 47 shows the appearance on March 18, 1910.

Fig. 48. On February 6, 1911, a radiograph was taken which, I am sure, will surprise you. It is seen in Fig. 48, where we note a distinct resorption of the four upper incisor and roots.

I admitted that the previous case might have been purely traumatic and restricted to the laterals, yet here, where the lateral suffered less than in the previous case, the depradation is much greater, almost as bad as in the case of my own patient.

The next case was a patient of Dr. Kemple's, and discloses rather extraordinary conditions. I am sure that some of those present are saying to themselves, "Of course, the cuspids did it." But please note the last two cases I have to present. The first radiographs were made January 24, 1910.

Fig. 49 shows the right side with a cuspid erupting. The lateral root is seen to be intact, but the central seems to be resorbing.

Fig. 50 shows the left side in very similar condition. The last radiographs were taken April 13, 1913, and appear in the next two illustrations.

Fig. 51 shows the right side with cuspid brought into position, but the root of the central incisor is badly resorbed, the lateral, however, being still intact.

Fig. 52 shows the left side, which is quite similar. The last case which I have to show you is rather unique. I do not know the clinical history. The illustrations are not as good as I would like, but the patient lived out of town and we have not been able to get another sitting. One point of peculiar interest is that the cuspids being congenitally absent, can hardly be the mischief makers in this instance.

Fig. 53 shows the right side. It is evident that there is no permanent cuspid. We note the temporary cuspid present and not resorbed, though the resorption of the alveolus about this tooth and the lateral as well, seems to leave them with very little bony attachment. But the central either has lost its apex or else never had one.

Fig. 54 shows the left side. Here we see resorption of the apices

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of the deciduous cuspid, the permanent lateral and the central. Yet there is no permanent cuspid.

Gentlemen, I trust that this rather hastily compiled record of radiographic data may result in inspiring some brighter and more scientific mind to take up these problems for us.

Discussion of the Paper by Dr. R. Ottolengui.

Dr. F. G. Kemple, New York.

The radiographs shown by Dr. Ottolengui seem to open up a new field of difficulty and complication and study, not only for the orthodontist, but also for the physiologist and the pathologist. Just what causes the roots of the deciduous teeth to absorb, I believe is still an unsolved problem in physiology, but we recognize it as a normal physiological process and have, therefore, been content to answer the question in this manner. But the absorption of the roots of permanent teeth, which are to all appearances perfectly healthy, is a phase of the subject that has not been very deeply studied, or at least it has not been discussed in dental literature. It is this phase of the subject that so vitally interests the orthodontist, and I hope that Dr. Ottolengui and others will continue to study and discuss this question from year to year until a satisfactory solution of the question has been reached.

When an orthodontist discovers a beautifully developed permanent tooth, strong and of good structure, becoming very loose—apparently almost ready to drop out of its socket—he is suddenly seized with something very akin to heart-failure.

The first case of mine shown by the essayist was that of a boy past thirteen years of age, who was slow in erupting his teeth. At this age he still retained three lower deciduous molars and an upper deciduous cuspid. The upper molars and bicuspids had drifted forward and had reduced the space for the permanent cuspids to about one-half the required amount. The first radiographs showed the permanent upper canines to be directed mesially with their crowns lying over the labial surface of the ends of the roots of the permanent laterals, pressing the roots of the laterals in a lingual direction and causing their crowns to be tipped forward. The central incisors occupied a normal vertical position. These radiographs were made for the purpose of locating the permanent cuspids, and neither the radiographer nor myself noted any resorption or apparent non-development of the roots of the central incisors. I supposed the radiograph had been taken at an angle that did not show the full length of the root of the centrals. In the treatment the centrals were disturbed very little, almost all of the force being

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exerted to move the molars and bicuspids distally. About eight or ten months after I started treatment, the upper central incisors became very loose, so loose that I feared they would be lost. I immediately had other radiographs made, but these did not show, apparently, any more resorption of the roots of the centrals than did those that were made ten months before, but they did show a closer encroachment of the crowns of the cuspids on the roots of the centrals. This gradual encroachment of the crowns of the cuspids on the roots of the centrals, and the extreme looseness of the centrals made it seem imperative that the cuspids should be moved away from the roots of the centrals. An incision was made through the gum, the outer plate of the alveolar process was cut away and the crowns of the cuspids were exposed; small hooks were cemented in the crowns of the cuspids and elastic ligatures were applied to force the eruption of these teeth and to draw them away from the absorbing roots of the centrals. After this operation the centrals very soon became firm in their sockets, and radiographs made by Dr. Ottolengui two and a half years later show no increase in the resorption of their roots. It is needless to say that these teeth were not disturbed in any way during the remainder of the treatment.

The second case of mine which the essayist showed is not quite a fair example to submit, if we are examining normal conditions. The patient, male, nineteen years of age, underdeveloped both physically and mentally; all of the lower teeth and nearly all of the upper were badly affected with pyorrhea, and the two upper permanent cuspids were congenitally missing. Such a condition can hardly be regarded as normal.

The essayist has shown cases where the roots of deciduous molars were resorbed when there were no apparent successors present. This would indicate that the force of the erupting permanent tooth is not the only factor in causing the resorption of the root of the deciduous tooth. He could also have shown any number of cases where the roots of deciduous teeth were not resorbed when there were no permanent successors present, as well as showing, as he did, other cases where the roots of these teeth were not resorbed when the permanent successors were present. This might indicate that root resorption is entirely independent of the pressure from another erupting tooth. If this be true, it is important that we learn as soon as possible what are the active elements in root resorption, and whether or not they can be controlled.

All of these questions of congenitally missing teeth, root resorption, malocclusion in about ninety-eight per cent. of the human mouths of civilized peoples, pyorrhea and caries, lead me more strongly to the belief that the human denture is undergoing a retrogressive evolutionary change that may be more rapid than we suspect; and while these changes

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are taking place there is no law except the law of variation to account for these different conditions. Unless some means be found by which the original function of the dental organs can be restored, dentistry cannot hope to hold in check the growing tendency toward such conditions as those with which we are trying to battle.

Dr. Martin Dewey, Kansas City. This question of the physiologic and pathologic resorption of the roots of teeth is a very interesting one, and after everything we know has been said, there is much more yet to be said. Dr. Ottolengui has opened up a problem that will have to be approached from several different views. As regards the cause of resorption of the deciduous teeth, Dr. Ottolengui quotes from Noyes very correctly, but he misinterprets him. He says the advancing permanent teeth cause resorption of the deciduous teeth.

Dr. Ottolengui. No, I did not.

Dr. Dewey. The theory is held that the advancing permanent teeth does have something to do with the resorption of the deciduous teeth. It is not permanent pressure that causes the resorption of the deciduous teeth. If the crowns of the permanent teeth ever touch the roots of the deciduous teeth resorption stops in that area. Why? Because there is not tissue between the roots of the teeth and crown. The organ which causes resorption of the roots of the teeth, whether physiological or pathological, is the osteoclast. I do not believe, as Broomell does, that there is a special resorption organ. I do not believe there is any special organ or development of organs, or development of cells that causes resorption of the deciduous teeth. The osteoclasts are there all the time, but conditions must be brought about to cause them to work.

There are two general constitutional conditions which materially affect the resorption and non-resorption of roots of teeth. These are tuberculosis and rickets. Rickets present a clinical picture which cannot be misinterpreted, but it has been overlooked.

Several years ago I was referred to a series of articles and monographs by Dr. Hertzler, professor of surgery in the University of Kansas on these two particular diseases, written by Dr. Jenner, who was professor of diseases of children in London. He wrote these monographs on rickets, tuberculosis and abdominal tumors. In rickets, as far as dentition is concerned, the first thing that occurs is a tardy eruption of the deciduous teeth. The first deciduous tooth will not make its appearance as early as it should. Finally, when it makes its appearance, the next thing that occurs is its early loss. The reason it is lost early is because of imperfect calcification of the roots. If the child has a rickety dia-

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thesis, the roots will be faultily calcified, and the roots of the first permanent molar will be calcified to a great extent sooner than the lateral. The root of the deciduous cuspid being the last tooth to be calcified in the deciduous set, necessarily it occupies a close relation to the time of calcification of a portion of the permanent incisor. So in the cases in which Dr. Ottolengui shows where the root of the permanent central is resorbed and the roots of the cuspid and lateral are not resorbed, there is a difference in resorption because of the difference in the time of calcification. There is imperfect calcification of the roots of the central, but not of the lateral.

In tuberculosis you have just the reverse. Teeth erupt on time. Deciduous teeth make their appearance at the proper time, but are not lost at the proper time. The root is not resorbed because, in my mind, the osteoclast is simply a specialized leucocyte. The leucocytes, especially in cases of tuberculosis, are extremely busy. They have more important work to do than the resorption of the roots of the deciduous teeth. Tuberculosis does not interfere with the eruption of the teeth nor with calcification. A permanent tooth calcifies just the same. It meets with opposition and is deflected.

Children with tuberculosis are mentally equal to or above the normal; they have fair skins, good red cheeks and they have the entire clinical picture which goes with tuberculosis. These are the cases in which the teeth resorb slowly. In rickets the bones are large, the wrist joints are large. There is a thickening of the epiphyseal cartilage. The upper arches are badly contracted. As a result of that, these two constitutional diseases are responsible, in a large measure, and are causes, of why in one case the roots of the teeth are resorbed, while in other cases they are not.

As to the pathologic resorption of the teeth, that is a little different, because necrosis accomplishes it, and you will have necrosis of tissue around that neighborhood, and you do not have the rebuilding of the bone as in the case of resorption of the roots of the teeth which Dr. Ottolengui shows. There is resorption of the alveolar process around the roots of the tooth. The osteoblasts rebuild the bone. The root of the tooth is missing and does not rebuild because the dentine papillæ has completed its work and is never reformed.

Dr. Federspiel. Is there a decrease or increase in the leucocytes?

Dr. Dewey. An increase. The osteoclast is a specialized leucocyte, and the leucocytes are busy somewhere else. Cure a case of tuberculosis and resorption of the roots of the deciduous tooth will take place. I do not think moving the teeth have been responsible for the resorption of the roots of these

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teeth. We must go back further than that in searching for the cause. The cause may have been in faulty calcification of the roots in the beginning. Roots of permanent teeth have been resorbed that have never been moved.

Dr. Ottolengui has cited cases confined to the incisors. He has related cases confined to the centrals, and not laterals. There were cases in which he found the central root was not resorbed, but the lateral was affected, again because of the difference in the time of calcification and conditions which were present at the time the teeth were calcifying.

In the presence of a certain constitutional condition there is faulty calcification of the root and bone around the root; then when the constitutional conditions become fully normal, and the rickety diathesis disappears the osteoblasts produces the development of bone at the end of the tooth. The pulp has nothing to do with the resorption of the tooth. We have never demonstrated that an osteoclast was ever present in a pulp. Resorption always occurs, or osteoclasts are found in the region which has to do with the peridental membrane. The osteoclasts resorb the roots of the teeth gradually. The blood vessels are not disturbed, consequently the pulp is not disturbed, and following resorption there is rebuilding of normal bone. I do not know but that it would be interesting to find out in these cases whether the resorption stops or progresses until the whole tooth is lost. If the whole root were faultily calcified, the whole root of tooth would probably absorb. When we got down to normal dentine the resorption would stop. Bone would build around there, because the osteoblasts being present, normal development of bone would take place just the same as we would have it in physiologic resorption of deciduous teeth.

Resorption of the roots of the deciduous teeth is a strange thing. The part of a deciduous tooth that is first resorbed is not always that portion close to the permanent teeth. You will find areas of resorption on the side of the tooth. There will be certain areas of resorption at different places. There will be an area cut out of the cementum and the dentine, and then the cementum built over again, and that tooth will be patched in that particular region. The apex in the area of resorption will grow, will build in, and the fibers will become attached; the roots and the tooth cut off and built on again to give a nice masticating apparatus.

In those cases Dr. Ottolengui cites, resorption of the root does not occur in the whole broad surface at one particular time, but a portion is cut off, and then probably cementum is laid down and dentine is cut off until we get down to normal dentine, and then it builds over and stays there without any further resorption. The reason a central incisor

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becomes resorbed and not a lateral is due to imperfect calcification of one and perfect calcification of the other.

It is well to pay more attention to constitutional conditions as being the etiologic factors in resorption and non-resorption of the roots of teeth than to consider all these teeth as being alike. They are not all alike. If the teeth that were resorbed were abnormal, I do not think the moving of them had anything to do with it. The reason we have a dead pulp in pathologic resorption in tumors and abscesses is because we have other pathologic conditions besides those in the cases which Dr. Ottolengui has related.

Dr. J. Lowe Young, New York City.

I am very glad we have had this paper by Dr. Ottolengui, as I have had some cases in which there has been resorption of the roots of the permanent teeth and with the permission of the Chair I will describe these cases, for I am sure the essayist wishes to get all the evidence possible regarding such phenomena.

Before describing the cases in which resorption was found I would like to describe another case, because with our present knowledge I would consider it criminal to treat such a case in the way I treated it at the time, which was several years before I ever heard of or saw any evidence of resorption of the roots of the permanent teeth.

Case I.

Case I, was that of a boy twelve years of age. His upper incisors were very much separated and the roots converged, and the radiograph shows that the unerupted cuspids appeared to be pressing the lateral roots against the central roots. I constructed an appliance so as to force the roots of the lateral incisors against the crowns of the unerupted cuspids with the hope of moving them distally, and I did it to such an extent that one of the cuspids was a little too far when erupted. As far as I know there was no resorption in this case, but I did not have a second radiograph taken. I wish to repeat that I would not think of such a method of treatment now.

Case II.

A case of a young lady with an impacted upper cuspid on one side, the lateral in contact with the first bicuspid, was referred to me by a dentist who had been associated with the dentist that cared for the teeth of this young lady's mother. After I procured models the dentist called on me, and when I told him what I intended to do, he said: "I am afraid to have anything done for this young lady. They are personal friends of mine, and the mother of that child has lost her four upper incisors due, we think, to the regulation of her teeth by means of rubber plates. The roots resorbed, and the four incisor crowns dropped out.

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I would not have this girl's teeth lost for anything." I said to him, "you need not be alarmed about that," and without any radiograph I opened up space enough for the cuspid which, apparently, was quite ready to erupt; but as it did not put in appearance as soon as I thought it should, I had a radiograph made, and then, to my surprise, I saw the condition of her incisors. I retained the case and waited for the cuspid to erupt and the incisor roots to move forward, as this case was treated with an expansion arch and ligatures. After *several months* the cuspid began to erupt and the incisors that had been rotated drifted back a little and the roots did not move forward.

After Dr. Angle showed me his new appliance, I was tempted to apply it to this case, but before doing it I had another radiograph taken which showed that the roots were no better, but possibly a little worse, so I decided to let them alone, as the cuspid had then about erupted to the point where it touched the lower teeth. I have not seen this young lady in a year and a half, but when last seen, her incisors were firm. I saw this patient's dentist April 1, 1914, and he had seen the young lady very recently and he reported her teeth in fine condition.

Case III.

Figs. 37 and 38 show radiographs of the unerupted upper cuspids of a boy twelve years old. On the one side you will observe the area of resorption was not on the end of the root, but on the side of the root and on the other lateral there is very little resorption on the end of the root. You will also observe that the four incisors are quite separated or fan-shape. The appliance used in this case was so constructed that the roots of the incisors would not be carried apart and thus press on the unerupted cuspids, but the crowns of the incisors would be moved toward the median line and thus brought in contact, hoping in this way to prevent further resorption. Figs 43 and 44 show radiographs after treatment and in them you will observe that the lateral on which there was resorption on the side of the root got no worse; the other lateral on which there was slight resorption at the end of the root got very much worse. While these teeth were a little loose, they were never alarmingly so. The incisors were retained by bands on the laterals with a lingual wire soldered to them, but after six months the laterals were found to be as loose as when put on. It was decided to remove this retainer and band the centrals with a lingual wire soldered to them and extending distally to each lateral and thus prevent the incisors separating, but permitting a freer movement of these teeth when in use, and I am pleased to say they soon became quite firm and, as far as I know, are all right now.

I was very much pleased with Dr. Dewey's discussion. There is one point I would like to have had him speak about, that is if he can

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throw any light on the apparent resorption of the side of that one root. It could not be due to imperfect calcification on the side of the root.

Dr. Monroe. Was there any rickets or tuberculosis in the mother's case in Case II?

Dr. Young. No. The grandmother of this child lived to be eighty-six years of age, and the mother was wonderfully well developed, and so was the girl. She was a splendidly developed girl and large for her age. Her mother was a very large woman. The father I never saw and do not know what kind of teeth he had.

In Case III the father was a large, healthy looking man, but the mother rather frail. The boy, while well developed mentally and above average in size, seemed below par physically.

Dr. Ottolengui. (Closing the discussion): I want to call attention to one point I did not think of when writing the paper, and that is, in both of my own cases, and in one of Dr. Young's, and one of Dr. Kemple's we had to deal with what might take place on both sides. In Dr. Young's case the maleruption was only on one side, and yet all four teeth were cut off. It is hard to comprehend that one erupting cuspid caused a disturbance which went right across and cut off the roots of four teeth.

To come back to my own cases for a moment, I would report the fact that this child was once a mouth-breather. In my view a child may be a mouth-breather and yet not be emaciated. Fat may be a result of faulty metabolism, which may be accentuated by faulty breathing. This child was a mouth-breather, and had had adenoid growths removed. She was a fat child. You will observe there was a lapse of one year and one-half in the course of treatment, and one of the reasons for that lapse, was that she developed an acute Bright's disease.

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Cast Gold Inlay Making by the Impression Method.

By Dr. W. Ray Montgomery, Buffalo, N. Y.

Read before the Union Meeting of the Third and Fourth District Dental Societies at Schenectady, New York, October, 1913.

This paper should in no wise be construed to be a discussion of the relative merits of the gold foil filling and the gold inlay, each of which has its own wide field of usefulness, but when the cast gold inlay is indicated there are two different methods of procedure by which the wax pattern of the inlay may be obtained: the direct method and the indirect or impression method.

The direct method is the original Taggart method. By it the wax pattern is formed directly in the tooth cavity in the mouth.

The indirect or impression method consists of obtaining an impression of the cavity, and from this impression a model which is an exact reproduction of the cavity, and in which the wax pattern may be formed and the inlay afterwards burnished and finished outside of the mouth.

The advantages of this method for many cases are great and the results to be obtained so superior that it is doubtful if any person having mastered the technique would revert to the direct method for the class of cases requiring very extensive occlusal restorations or extending far beneath the gum line, even should they continue to employ the latter for the more simple fillings.

The impression method may also be used for porcelain inlays and in crown work for reproducing root ends, but this paper is confined to its use in connection with the gold inlay.

If I am correctly informed, the original conception of taking impressions of cavities by bringing stress to bear upon compound at direct

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right angles to the cavity margins is also that of Dr. Wm. H. Taggart. Dr. Van Woert, of Brooklyn, obtained the suggestion from Dr. Taggart and devised the system of making the trays which will be described. The technique which will be given is the original, with such alterations and modifications as have crept in from time to time during the two years of its use in our office.

Technique.

After properly preparing a cavity for the reception of a cast gold inlay, an impression tray is made for it, in which to take a modeling compound impression. A new tray is made for each individual case. The metal for this should combine thinness with stiffness. It must be thin enough to pass readily between the teeth and stiff enough to hold the impression material firmly in place. Any sheet metal combining these properties may be used. Platinoid plate obtainable from the supply house in three (3) inch squares is superior to anything else that we know of. No. 34-gauge is the thickness most often used, but where approximal space permits, as heavy as 30-gauge may be employed.

The fundamental principle to be kept in mind while constructing the tray is, that the impression material must be carried with equal force to all parts of the cavity with a pressure that is at right angles to all of the margins. If this precaution is not taken, and a margin is approached at an obtuse angle, the compound will creep on that margin and the impression will fail.

Construction of Impression Trays.

Hence, if an impression is to be taken of a disto-occlusal cavity in a molar or bicuspid, a strip of the metal is cut slightly wider than the cavity at its widest part and the corners at one end are rounded. A measurement is taken from slightly below the gingival margin to the occlusal plane of the tooth, and at this distance from the end of the strip of metal it is bent sharply at right angles. By so doing, the tray may be passed between the teeth until it rests firmly against the occlusal surface, with the assurance that the gingival margin is covered and that the gum tissue is not being unduly impinged. The remainder of the strip serves as a handle. If the cavity margins lie entirely on the distal and occlusal surfaces so that the tray as now formed approaches all of them at right angles, bend the vertical edges of the approximal portion of the tray slightly inward, to give this a concave surface, and it is ready to use. If, however, one or more margins have been carried onto other surfaces, this form of tray must be so modified as to approach these margins at right angles. Thus, for a buccal or lingual margin the tray will be cut slightly wider and bent around over

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that surface. If a cusp is absent or the occlusal portion of the cavity has been extended to include a groove on another surface, a tongue may be cut and bent over. Your own ingenuity will enable you to readily form a tray for any required condition.

If the cavity is a mesio-occlusal, proceed as before, but at a point on the handle which is slightly back of the distal portion of the cavity, bend it back upon itself, thus allowing the handle to protrude out of the mouth. In the case of a mesio-occluso-disto cavity no handle is necessary. Bend a piece of the metal staple shaped to fit the case. The impression tray ready, the impression is to be taken. For this the Kerr, otherwise known as the Detroit Modeling Compound, is preferable. The stick form is very convenient. A quantity slightly in excess of that required to fill the cavity is heated over the flame. The tray is also heated and the compound placed upon it.

Dr. Van Woert advocates punching holes through the metal with a plate punch so that the compound will pass into the holes and be kept from dragging when forced into place, but if the precaution is taken to have the tray hot when the compound is placed upon it, it will adhere so that no trouble will result from its pulling away. On the other hand, if the holes are punched in that part of the tray going between the teeth trouble is often experienced from the compound forcing through the holes and wedging against the approximating tooth.

Taking the Impression. The compound being on the tray it is passed over the flame until thoroughly soft, then allowed to stiffen slightly and again passed quickly over the flame to resoften the surface more than the rest of the mass, so that the stiffer portion underneath will carry the softened surface firmly to place, giving a sharp definite impression. In case of an approximal cavity, after pressing firmly to position, it is well to hold it with a finger of the left hand over the occlusal portion while a thin burnisher is passed between the teeth, forcing that part of the impression into the cavity. Care must be taken to keep up the pressure until the compound is thoroughly chilled, otherwise if the tray has sprung slightly at the bend, it will spring back and ruin the impression. It is not necessary to use the burnisher when the teeth are close together, but it gives added space which is acceptable when removing. When the compound is thoroughly chilled, examine it, and with a sharp lancet trim off any that may interfere with its ready removal.

Taking the Bite. An accurate impression having been obtained, a bite is taken. This is needed:

1st. As a guide in carving for occlusion.

2d. To direct us regarding approximal fulness and contrast.

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3d. To give the remainder of the form of the tooth containing the cavity and the relationship of its neighbors. It may be obtained by taking a mush bite in either base plate wax or compound. The compound is more to be depended upon for accuracy. By including several teeth in the bite, the models may be oscillated, thus showing the proper form to be given the occlusal surface for anatomical occlusion.

The cavity is now sealed and the patient dismissed. The inlay may be completed, ready for cementation in the laboratory at your leisure, and there is much of the detail work that your assistant may easily be trained to do.

Amalgam Models.

The most satisfactory material known as yet for making the model is amalgam. Opinions differ as to the superiority of a silver—tin or copper amalgam. The writer's experience is limited to the former. Cement may be used when the inlay is to be of porcelain, but for gold, this material is not strong enough to allow burnishing and finishing. In order that the amalgam may be well condensed it is necessary to surround the impression with a matrix. This is done by forming a mass of plaster on the slab. When quite stiff, so that it will not run, the impression is imbedded in it and the plaster moulded about it as desired. If preferred the plaster may be placed in a rubber ring such as is furnished with a mouldine outfit or a metal ring made in halves. When the plaster is sufficiently hard examine it carefully to see that all the margins in the impression are clear and well exposed. Scrape the plaster smooth about the compound and it is ready for the amalgam.

In order that all the details of the impression may be sharply reproduced it is necessary that the amalgam be mixed somewhat thinner than for filling. The portion used to cover the walls and margins should be quite wet. This is inserted in small pieces and gently rubbed over the surface of the impression. The first layer is covered with more which is much dryer and considerable more pressure is used, rubbing and tapping as well as pressing it to place. The remainder of the mix should be quite dry. Only by doing this part of the work with care can a sharp, accurate model be obtained. Any excess of mercury is wiped away or absorbed with tin foil. When the amalgam is sufficiently hard the plaster matrix is broken away and the model separated from the impression. In the bite, an impression of the tooth cavity will be found and the model is accurately adjusted to its complement in the bite. One model is now run in plaster, and an excess left to the distal of the last tooth, which is trimmed down to a horizontal plane and a notch cut in it. This is varnished, and the opposing model run, allowing plaster to flow over onto the notched surface to denote the correct position of the models

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when separated. After lubricating all surfaces with which the wax may come in contact with either vaseline or equal parts of castor oil and glycerine proceed with the insertion of the wax.

By the direct method the wax is properly softened and forced under pressure so that it goes to all parts of the cavity and all margins are perfectly covered. The same procedure may be followed when inserting the wax into the amalgam die, but in shallow approximal cavities in long teeth it is often difficult to drive the wax perfectly to all parts of the cavity and the writer has resorted to the method of flowing the wax into the cavity with a warm spatula. Theoretically this is very bad practice as a wax made up largely of beeswax and paraffine, as all carving waxes are, expands very rapidly as its temperature rises, which means that although a cavity may be full of hot wax, it will not be full when the wax cooks, and as wax brought to a liquid state is much hotter than when only softened, it follows that a cavity filled with molten wax will not be as full when this cools as it would have been had it been filled with moderately warm wax. However, this discrepancy may be largely overcome if it is melted in a very little at a time, one layer covering another and filling in the space left by the shrinkage of the preceding. By carrying the spatula into all the grooves and deep portions of the cavity the wax will fill it and a plus fulness is left over all the margins to be trimmed down. We have succeeded in obtaining very snug fitting inlays in this way. The lubricant will prevent the wax from sticking to the model.

When the cavity is full, allow the wax to harden. Resoften the occlusal portion and place the opposing model in position. By allowing the wax to harden, then softening only the occlusal surface, in the case of approximal cavities there is not the danger of driving the wax out of the cavity that there is if a mush bite is taken in soft wax. The occlusion is now definitely defined and the possibilities for reproducing lost cusps, sulci, grooves, ridges, etc., are only limited by the skill of the operator. And not only to reproduce beautiful occlusal surfaces, but to produce occlusal surfaces which occlude.

The space between the die and the approximating tooth in the model has been filled across solid with wax and as the function of the approximating plaster tooth is to define fulness and position of the contact point, it may now be broken away, thus exposing the entire approximal surface, including the gingival margin of the inlay. It is a simple matter having it thus exposed to trim and polish this surface of the wax and see that there is no excess at the gingival margin.

Now that the wax pattern is carved just as the finished inlay is to be, all scratches and instrument marks are removed and the surface beauti-

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fully polished by rubbing it with a small, hard pellet of cotton, slightly damped with either oil of cajaput or oil of eucalyptus, and allowing a thin coating of the oil to dry on the surface. Probably the best place for the insertion of the sprue wire is at the contact point. It is not only centrally located but will give an excess which may be finished down for tight contact. The sprue wire should be very firmly attached to allow of considerable handling without becoming loosened. The pattern is now removed from the die.

Reasons for Hollow Inlays.

There are four very good reasons why the internal part of the wax pattern should be cupped out.

1st. In vital teeth to allow for a considerable thickness of cement as an insulation between the inlay and that part of the cavity directly over the pulp.

2d. By diminishing the bulk of metal the shrinkage is reduced.

3d. By forming a retention box in the inlay added retention is given.

4th. A saving of material which otherwise is a needless waste.

A very convenient way to do this is to hold the inlay by the sprue wire and with a sharp rose bur of medium size in the engine to bur away the superfluous wax. If Taggart's wax is used it may be burred out so that light may be seen through it and still be sufficiently thick. This method is also applicable to the cutting out of the inner portion of the wax when cusps are cast on shell crowns, thus securing an even thickness over the entire occlusal surface.

After carefully brushing and wiping away the shavings, replace the wax pattern in the amalgam die and see that it goes nicely to place. Examine the margins to see that none has been injured, in which case it is but the work of a moment to add more wax and polish it, when the pattern is ready for investment. If Taggart investment is used, coat the wax with investment material taken from the surface of the mix. This is thinner and smoother and will produce a smoother casting. After pickling the cast inlay in hydrofluoric acid to remove every particle of the investment material, and cutting off the sprue, place it in the die and examine it. If the work has been accurately done in certain cavity forms it will be found to fit well. In other cavity forms, however, the shrinkage will prevent perfect seating and it will appear that the gingival margin has drawn away. This, in the mouth, under the gum is hard to detect or remedy, but in the die it is easily burnished tight. With an orange-wood stick and the hand mallet gently tap it. Burnish all margins thoroughly and polish all of the surface except the immediate margins. The inlay is now ready for the tooth. Try it in the cavity; verify the occlusion; adjust the contact point and cement to place. Burnish gently and when the cement is sufficiently set, polish the margins.

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Inlay with Post.

If the inlay is to include a post to be inserted in the root canal proceed as follows:

Fit the post so that it may be removed without binding and in the same direction that the inlay draws. Have it project into the cavity sufficiently so that it will become firmly imbedded in the impression. After the impression is taken, coat the post with a very thin layer of hard wax. Proceed to make the amalgam die and mount it. By warming the post sufficiently to melt the wax, it may readily be withdrawn, the wax burned off and the post replaced loosely in the die. It will be withdrawn with the wax pattern and the gold cast to it.

Faults Observed in Inlays.

In building wax patterns in dies outside of the mouth, where close observation is possible, the writer has been impressed with the following facts:

1st. That in filling a cavity with inlay wax and causing the patient to grind into it, or in other words, taking a "mush bite," the wax is often caused to creep away from the cavity walls.

2d. That often the gingival margin does not fit tightly. This we have always supposed to be due to a shrinkage at this particular point. It has recently been explained by Dr. Price, of Cleveland, however, to be due to a shrinkage of the entire mass which in inlays having the M. O. D. form, or having occlusal dovetails, are prevented from being perfectly seated.

3d. That in the mouth, particularly well up under the gum line, it is very difficult to detect this fault, which may be proven as follows:

Take an inlay which does not fit the gingival margin tightly in the die. Place this in the tooth cavity in the mouth. With a fine explorer go over the cervical portion and it will be found to be difficult to discover that it is not a perfect fit. Replace the inlay in the die and with a heavy burnisher draw it down so that the cervical joint is made tight. Replace in the tooth and it will be found to seat itself as perfectly as before, thus proving that there must have been a space in the first place. This observation, together with a few others in which I have been able to examine minutely the gingival margins of otherwise beautifully fitted inlays made by the direct method, leads me to surmise that we may be having more poorly fitting gingival margins than we suspect.

4th. That reducing the bulk of metal, by cutting out all superfluous wax, very materially reduces shrinkage.

Disadvantages of Impression Method.

The two most apparent disadvantages to the impression method are:

1st. In adding the several intervening steps between the original and the final operations there

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is added opportunity for distortion, expansion and contraction of materials and other errors.

2d. The increased length of time required to carry through the operation.

Regarding the first, I am convinced that a perfect model may be obtained of a properly prepared cavity and the advantages of being able to complete the work under minute inspection, and to largely correct errors which, at the present time are unavoidable, far outweigh this disadvantage. The time question is solved if an assistant is trained to do at least a part of the laboratory work.

Advantages of Impression Method.

Its advantages, as we see them, are summed up as follows:

A very material saving of time to the patient in the chair.

In case of an imperfect wax model, failure in investing or casting, the patient is not inconvenienced.

All margins both in wax and gold may be more minutely examined, even with a magnifying glass, if desired.

In carving the occlusal surface, particularly when the restoration is extensive, the two methods will not bear comparison.

It is being recognized more and more that if we are to restore disordered oral cavities to the state of health in which they should be that more attention must be given to the perfect restoration of tooth form. In connection with this, one of the leading dentists in the country has described his procedure by the direct method, as follows:

"I have the rubber dam in place whenever it is possible to have it, and as I carve the inlay wax directly in the cavity, I have no guide whatever but a general knowledge of tooth forms, and it is not strange, therefore, that not infrequently I guess wrong, and so find my inlay, when cast, too high for the occlusion, however pretty the carving may be. Some men say they take a "mush bite," so-called, before carving the wax. This has not been satisfactory to me. Others carve the inlay, and then try in the wax, allowing the patient to close the bite. In this way I have a few times spoiled in one moment an inlay that I had spent thirty miutes in carving. In any event, it is a risk to the margins to try a wax patern in the mouth and have the patient grind upon it, and a mere closure does not disclose the interference which may develop under a free movement of the mandible. It is my belief that with a thorough knowledge of normal tooth forms, and of abraded tooth forms, and with practice in carving, one may become so dexterous in carving the wax that when the finished inlay is seated it will not be too high. In any

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event, these high points should develop on the cusps, and consequently. if the sulci and grooves have been made deep enough, the correction of the inlay may be made after the gold is cemented to place by using a carbon paper and grinding with the tiniest of carborundum stones."

Is it possible, gentlemen, that as nearly perfect results from the standpoint of utility, to say nothing of artistic possibilities, are as likely to be obtained in this way as would be if the tooth were held in the fingers directly before the eyes and with model of the occluding teeth at hand with which to prove the occlusion with no danger of muscles over which you have no control, contracting and ruining the work of a half hour?

Finally, as up to the present time, we have not been able fully to control expansion and shrinkage, and, therefore, an absolutely perfect fitting inlay is impossible, and as cement lines will disintegrate, it seems logical that all gold inlay margins should be burnished and the rational place to do this, without danger of pulverizing enamel, is in the amalgam die, furnished by the indirect method.

The Dentist and the Public Health.

By Albert H. Stevenson, D.D.S.,
Secretary, Oral Hygiene Committee, N. Y. State Society.
Read before the Central Dental Association of Northern New Jersey.

More than six hundred thousand of the lives lost in the United States last year were due to preventable diseases and from accidents. This is more than the total number killed in all our wars since the signing of the Declaration of Independence. There are now almost two million persons ill from maladies that are preventable by means at present at the disposal of science. These appalling statistics, compiled by the life insurance companies, testify to the justice of the demands of the ninety million human beings dwelling in this country for proper measures to safeguard the health of themselves and their progeny.

Among other efforts toward reducing this startling aggregate may be mentioned: Isolation of contagious diseases, sanitation, improved ventilation of public and private buildings, sewerage, removal of refuse from urban and rural communities, pure food laws and regulation of diet, all tending to protect and increase the resistance of the human body.

Responsibility of Dentists.

As guardians of the portal of this body, have not the dentists a very grave responsibility? In the practice of a profession that is concerned directly with the very entrance to this body, what is the

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relation of the dentist to the public health and its alarming record of mortality and invalidism? It is at least his duty to practice most rigidly prophylaxis, to advocate strict hygiene of the mouth, and to have a full knowledge of those considerations that are detrimental to good health as producing a condition of malhygiene of the oral cavity.

Under the caption of Malhygiene must be considered: Faulty bridges and crowns, ill-fitting dentures, overlapping and poorly polished fillings, malposed and irregular teeth, orthodontic appliances, carious teeth, abscessed roots, loose teeth, pyorrhea, improper diet and wrong application of the toothpick, the dental floss and the tooth brush.

Modern standards and technique of dental procedure leave nothing to be said of reparative operations in the foregoing. The difficulty of keeping arches with malposed teeth in a cleanly condition we are well aware of, and the loss of function with consequent malnutrition is evident to all. With one or more orthodontic appliances added to such a mouth a condition of malhygiene certainly obtains. Ordinary methods of cleansing as practiced by such patients do not suffice, and more rigid hygiene should be insisted upon. Several brushes shaped to reach all corners should be supplied by the orthodontist.

The Unclean Mouth.

With a mouth containing carious teeth, abscessed roots, or a condition of pyorrhea, the effect upon the general health must be considered. We have no right to limit our attention to local manifestations. Bacteria are evident in every mouth, and many varieties have been isolated. All the elements for their proliferation are present: water, oxygen, carbon, nitrogen; conditions are favorable in temperature, darkness. (1) Consider then the improperly cleaned mouth, with an area of decomposing animal and vegetable matter. What a fertile field this presents for the organisms that find entrance through the unprotected orifice. It was generally believed that the bacteria of the common infections, viz., diphtheria, pneumonia, scarlet fever and typhoid invade the body through the air passages, but Jonathan Wright and other investigators find that the turbinate bones of the nose and the ciliated epithelium covering the mucous membrane of the nose act as sieves or screens and prevent most bacteria from entering the throat, bronchi or lungs by this route. (2) The mouth, therefore, must be the chief route by which these infections reach the lungs or stomach. The function of the stomach may be impaired by this bacterial invasion. The hydrochloric acid, Nature's great germicide, is able to overcome the bacterial attack that occurs with the normal acquiring of food, but the constant ingestion of pyogenic material from a septic mouth oseriously interferes

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with and may prevent the normal secretion of the hydrochloric acid. (3) This may result in subsequent disturbance of the process of digestion.

With a wound on the surface of the body, the bacteria and their toxins are eliminated with the surface discharge, but where there is any lesion of the mouth, an alveolar abscess, for example, the septic material is swallowed or disposed of by the lymphatics or the blood. If the resistance of the tissues is high, and the individual in excellent health, this daily toxic dose may be taken care of, but the effect falls upon the entire alimentary tract. Dr. E. C. Kirk calls this the "toxic habit," and like all offensive habits it becomes apparent to others before it does to the afflicted. Other evidence showing the results of oral sepsis could be cited. The increase of papers on this subject appearing in the medical cournals is encouraging. Our good brother, the medico, is awaking.

Diet.

Incomplete as has been research along the line of dietics, we have enough to merit observation and application. Dr. Alfred Kunert, of Breslau, Germany, advises black or rye bread instead of the common flour loaf. He also finds as a result of his investigations that with whole rice as the staple food there is a diminution of the tooth lesions. Dr. Sim Wallace, of London, has divided foodstuffs into two classifications: non-cleansing and cleansing. In the non-cleansing he classifies all farinaceous and all sugary food in general without fibrous element; examples: new bread without crust, bread soaked in milk, milk puddings, porridge and milk, preserved fruit, chocolate and all sweets, honey, sweet biscuits and cake, bread and marmalade, bread and jam; and of the liquids, cocoa and chocolate. He declares these foods should not be eaten unless followed by the cleansing kind. These are fibrous foods generally, such as fish, meat, bacon, poultry, uncooked vegetables (cooked vegetables are as a rule cleansing, but in a less degree than uncooked), stale bread with crust, toasted bread, twice baked bread, pulled bread and cheese, fresh fruits (those requiring thorough mastication, as apples) fatty foods (as butter and margarine); of the liquids, tea, coffee, buttermilk, water, soups and beef tea. (4) With the modern quick-lunch counter as an adjunct to the high school, the "pastry lunch" served to the children should be of interest to the dentist. The water supply of the community is also a factor, and an analysis of it might reveal a deficiency of lime salts and solve many mysteries of his daily practice.

Rules for Oral Hygiene.

There being no uniform rules of oral hygiene, even among the dentists, this hygiene has not been receiving serious consideration by our educators. We all, I believe, agree that there should be a brush,

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even if we do not agree as to its form and embellishment. We must decide upon a practical application of it, adopting one of the several good methods now advocated, then advise its use, not once a day, nor twice a day, but *after every meal* and upon retiring. The only way to keep the mouth clean is to remove the débris immediately. According to the findings of Miller, Black and Kirk, the saliva "per se" has no germicidal power. With fermentation almost immediately occurring, the fertile area previously referred to is created. Why not, then, while giving instructions, advise correct and efficient hygiene? We should impress upon our patients the method and the frequency of the cleansing operation, with advice as to the proper dentifrice and the use of the dental floss. The exaggerated claims of germicidal powers attributed to the mouth washes and lotions should be exploded and these agents relegated to their proper sphere of usefulness. This would be genuine enlightenment.

These efforts alone are not sufficient. The dental societies must, for the time at least, become educational factors. Oral hygiene, in its modern capacity, is new. It is new to the pedagogues, new even to many dentists. We must take the initiative, as our schools do not teach it. An indication of the present status of oral hygiene in the curriculi of the public schools of the large cities of this country may be obtained from the following table. This data was presented by the writer to the Fourth International Congress on School Hygiene and obtained from the signed statements of Superintendents of the Departments of Education of nine of the leading cities: Baltimore, Boston, Cleveland, Newark, New York, New Orleans, Philadelphia, Seattle, San Francisco. (5):

MOUTH HYGIENE IN THE PUBLIC SCHOOLS

City	*Periods per Week	Earliest Grade Taught	Dental Inspection	Tooth Brush Drill	Text and Reference Books	Public Lectures
Baltimore	2	1st	Yes	No	Conn's Elem. Phy.	Night School only
Boston	1	1st	Yes	Yes	Conn's-Jewetts Richie-Millards	Yes
Cleveland	1	1st	Yes	Higher Grades Only	Gulick's Series	Yes
Newark	1	1st	Yes	Yes	Ritchie's Primer Krohn's Phy. Smith's Primer Gulick Series	To Teachers
New York ...	1	1st	Yes	Yes	Gulick Series	Yes
New Orleans..	2	1st	Yes	No	Krohn's Phy.	Yes
Philadelphia ..	2	1st	Yes	No	Many	No
Seattle	1	1st	Yes	No	Ritchie's Primer Gulick Series Wood's Hutchinson	No
San Francisco.	1	1st	Yes	No	Ritchie's Primer Caldwell's Primer	No

*Period—one-half hour Phy. and Hy.

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It will be noted that all have dental inspection and teach mouth hygiene from the first grade; however, but one-half an hour is allowed each week for the entire subject of physiology and hygiene in seven of the above cities, and but three have the tooth brush drill. Of the text and reference books cited, not one contains mouth hygiene as it is understood and applied by the dental profession. The City of New York, in its new syllabus in physiology and hygiene, prepared by Dr. C. Ward Crampton, has a graded system wherein by proper correlation with other hygienics the mouth is given its deserved importance. Dr. R. Ottolengui, of New York City, together with the writer, in collaborating with Dr. Crampton, proved most conclusively the value of the tooth brush drill, and it has been incorporated in the syllabus. The city of Newark reports a series of practical lectures delivered to the teachers in the four centers, meeting at the Franklin School, Warren Street School, Hamburg Place School, and Belmont Avenue School. By this means the teachers were prepared directly to teach the application of mouth hygiene in the classroom. These lectures, I understand, have now been discontinued.

One of the first steps in a dignified educational campaign would be to interest the department of education. With the interest would come co-operation, and after the inclusion of mouth hygiene in the school syllabus and text books the dental society would be relieved of all further responsibility in the schools. For the public there is the illustrated lecture, always popular; the exhibits, always convincing to the ignorant class, and the motion picture medium. There is one film now in circulation and others are being prepared. A London experimentor is preparing a film showing bacteria in motion. The public has a very wholesome respect for bacteria enlarged and thrown upon the screen.

Dental Clinics.

Dental clinics have been successful, if we judge by the amount of suffering they have relieved. Dr. Ernst Jessen, of Strassburg, Germany, has made a careful résumé of the clinics of Germany, Switzerland, Sweden, Austria and Denmark. Dr. Sim Wallace has done the same with the clinics of Great Britain. (6-7) Their reports, as do all from various parts of the United States, pay a tribute to the excellent work accomplished by the perfected dental clinics. But these clinics have not, and never will, offer a solution as to how forty-five thousand dentists can care for the mouths of ninety million. Without detracting one iota from credit due the workers in these clinics, or the relief they are giving to humanity, educationally the dental clinic helps but little. Operators cannot be supplied rapidly enough to respond to the great demand, and there is plenty of pain-relieving work to be done without time for prophylactic treatment or education. It is here that the dental nurse will ulti-

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mately fill the gap. She has rightly been called by Dr. Fones, "The Keystone of the Oral Hygiene Movement." This nurse, or prophylactic assistant, could cleanse these mouths and could instruct in hygiene. Legislate her into existence or not, she will come, and before long, as have come all the good things we now enjoy, from necessity. The time is not far distant when a clean mouth will be as compulsory as school attendance, and the one cannot be enjoyed without the other.

Hardly a civic health report is issued but contains reference to the deplorable conditions of mouths. Some are direct challenges to the dental profession. Here is one from one of our best organized health departments:

"The largest number of physical defects found have been those of the teeth. The relation of decayed teeth and unclean mouths to malnutrition, adenitis, and the liability to contract cantagious diseases, is too well known to merit more than passing comment. Most of the children showed a more or less complete lack of dental hygiene, their mouths, in many instances, being filthy to a degree almost unbelievable. Some interesting facts have been emphasized by the examinations: First, almost complete lack of dental treatment; second, the importance of preventive dental treatment. Could these children have had proper dental treatment, the present deplorable conditions could have been reduced 75 per cent., to say nothing of the influence of these conditions upon the health of these would-be wage-earners." (8)

You see, gentlemen, we are confronted with a responsibility greater than the skillful reparative work we are doing. To our profession is given the privilege of caring for the gateway to this temple we call the body. With our equipment and our attempts to minister to that body through the care of the mouth we have an obligation—a contract—to fulfill. "The obligation of a contract," says Calhoun, "belongs not to the civil or political code, but the moral. It is imposed by an authority higher than human, and can be discharged by no power under Heaven without the assent of him to whom the obligation is due. It is binding on conscience itself." It is the fulfillment of this contract that will place our profession where it rightly belongs.

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The Great Illinois Celebration.

The Golden Anniversary of the Illinois State Dental Society will be recorded in dental history as one of the greatest professional meetings ever held. Three thousand bronze buttons, intended for distribution among the society's members and guests who registered, were soon exhausted. One thousand celluloid buttons were then procured and quickly distributed, and an additional supply of five hundred were also used up on the first day. These registered forty-five hundred added to the several hundred students and the unregistered men who arrived during the evening or on the second day, swelled the actual attendance to over five thousand.

International Clinics.

The international clinics, by men from all parts of the United States and Canada, were scheduled to begin at thirty minutes past ten o'clock on Monday morning, March 23d. The actual time of beginning these demonstrations was thirty minutes past ten o'clock on that Monday morning. This evidence of promptness and dispatch was the keynote of the entire three days' proceedings. Everything occurred as planned and at the time set. Monday afternoon was also given over to clinics by visitors, the international clinicians numbering one hundred and seventy-seven. Many of these clinics were of exceeding interest, but as one visited table after table, he could but be struck by the fact that the casting process in some form was being demonstrated in all parts of the

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great hall. What a revolution has been wrought in dental practice by this one invention.

Oration on Operative Dentistry.

An interesting clinician was still explaining his process to a small crowd at six o'clock. Yet before eight o'clock, this same room had been cleared of tables, and twenty-five hundred persons were already seated, watching the rythmical movements of two professional dancers engaged to amuse the audience while assembling.

At eight o'clock the president, Dr. Logan, struck his gavel and introduced Dr. Edwin T. Darby to deliver the oration on "Operative Dentistry." Dr. Logan explained that Dr. Darby, after preparing his paper had fallen ill, and in these circumstances Dr. Edward C. Kirk had kindly consented to attend and read Dr. Darby's address, with an addition thereto by Dr. Kirk himself. However, the fates had been kind, Dr. Darby had fully recovered and was present in person.

Dr. Darby was received with an ovation which evinced the high esteem in which he is held throughout the country. His oration described the difficulties with which dentists contended, at about the time of the founding of the Illinois Society fifty years ago, and dating from that period he recited a graphic story of the many important changes in dental practice. The oration attracted the hushed attention and interest of the immense audience, and was in itself a masterly résumé of the theme. Dr. Darby was followed by Dr. Kirk, who practically took up the subject where Dr. Darby left off. Dr. Kirk's all too brief address was a classic, and a splendid argument to prove the close relationship between the discoveries of our scientists, and the actual practice of our advanced students and best operators. Dr. Friesel followed with another fine address, and the subject was then informally discussed.

Illinois Day.

Those who left the great ballroom of the La Salle on Monday night, thinking of it as a vast auditorium, were amazed to find at nine o'clock on Tuesday morning that it had been transformed by solid partitions into five rooms, each accommodating one hundred and fifty, seated at tables, while the smaller ballroom was similarly partitioned into three rooms more of the same dimensions.

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These Illinois Day Clinics proved to be as wonderful as they were unique. The guests of the society were all seated at tables arranged for ten. To each table, at the stroke of a gong, came a clinician, with all appurtenances needed for the scheduled demonstration. A master clinician stood on a chair and described the details and technique of the clinic, while the seated clinicians illustrated the work with models, specimens or apparatus, all the paraphernalia being in duplicate, so that the clinic at every table was the same.

Fifteen minutes was allowed for each clinic, and three minutes was granted for changing from one room to the next, or forty-five minutes' idle time for the audience who sat through the fifteen clinical demonstrations. So accurately was all this planned, and so well conducted, that when the gong sounded at one o'clock, all the clinics had been given in all the rooms. Over two thousand guests had seen fifteen clinics each, without leaving their seats.

Too much cannot be said in praise of the man who conceived these clinics, of the able assistants who devotedly obeyed his lightest or most seriously given order, or of the clinicians who so admirably did their part. It was the most magnificent evidence of executive ability ever seen at a dental meeting.

Oration on Crown and Bridgework.

The oration on "Crown and Bridgework" attracted another huge audience that filled the great ballroom. The orator of the evening, Dr. A. W. Thornton, of Montreal, Canada, was at his best, and to those that have heard him this means much. His address was finely prepared and splendidly delivered.

Dr. J. Leon Williams followed with a description of his researches relative to tooth forms, and Dr. A. J. Bush, of Columbus, Ohio, and Dr. Herman E. S. Chayes, of New York, responded with addresses that merited the repeated outbursts of enthusiastic applause. This evening, like the preceding one, aroused a feeling of inspiration in all.

Chicago Day.

Wednesday was heralded as Chicago Day. One hundred Chicago dentists gave clinics in their own offices. Thus, on this day, the Chicago men played hosts and received the guests in their own offices. This was another

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unique, and much appreciated method of presenting clinics, at the same time affording men opportunity to see the offices of so many of their confrères.

The Banquet.

On Wednesday evening the Great Banquet. No other words describe it. The Great Banquet. The large ballroom of the La Salle, accommodating over nine hundred, and the smaller ballroom seating over three hundred more were filled. Over a thousand dentists, with some two hundred beautiful women gracing an occasion which was an occasion worth gracing! Two head tables! The upper tier seating the president and his speakers and special guests, while before him, at the lower tier, sat twenty-eight of the previous presidents of the Illinois State Society, including its very first president.

It was a glorious assemblage, and a fitting end to a marvelous meeting.

The Man of the Hour.

What is the great lesson to be learned from this wonderful meeting? This was not an International Congress, nor even a National Association meeting. It was just a State Society meeting! A State Society, however, meeting jointly with that famous local, the Chicago Dental Society. Yet the bare announcement that this was to be a great meeting, the greatest in the history of Illinois, attracted the largest attendance in the dental history of this country. Why? Because the Illinois men are known by their past performances, and what they conceive they carry out, and what they promise they perform. And so five thousand accepted the word of Illinois, and that word was kept to the letter.

So much of the men of Illinois, but what of the man of Illinois? No war is won without warriors; no battle decided without officers, and no campaign is successful without a general. And so likewise this meeting was great because of the great numbers assembled; it was successful because of the untiring zeal and devotion of the Illinois men, but the whole marvelously managed meeting was first conceived in the mind of one man. When the plan was first outlined to the members of his executive committee they declared it to be the dream of a man ambitious for his State, but a dream that could never be fulfilled. Yet,

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though these men prophesied failure, they did not shirk the work when they found that this dreamer was determined that the dream should be realized for the fame of Illinois. And the dream became a reality to its ultimate and minutest detail. And the name of the man who conceived, worked out and carried to success this splendid enterprise is W. H. G. Logan. All who attended this celebration came away with this man's name in praise upon their lips.

A Hint to The National.

The National Dental Association is at a critical period in its history. Reorganization has been just about achieved. The first meeting under the new regime is to occur in a few weeks. Then must the machinery for the management of a great national association be put in motion. In 1915 there is to be no meeting of the National, because of a promise to that effect made to the Pacific Congress managers. Thus the officers elected at Rochester will have two years in which to perfect the organization and to project a truly great meeting. But, speaking of even thinking of a great meeting for the National in 1916, are we not forced to recall the wonderful work of the Illinois men, and especially of one Illinois man? Would not the destiny of the National be definitely determined, if at Rochester we chose an Illinois man for president, leaving him to name Illinois men for important executive positions?

Correction.

In the March issue we published an article entitled "Local Anesthesia," by Dr. Theodor Blum, in which several type errors occurred. On page 188, line 12, "A stock solution of 0.06% sodium chloride, etc.," should have read "0.6%." Page 189, line 12; also page 191, line 15; and again on page 192, line 4, the word "interior" should read "anterior."

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DR. W. L. WHIPPLE, of St. Louis, Missouri, writes as follows: "Sorry I could not dine with you that night at the Biltmore. But let me warn you that the method of removing gold crowns, as mentioned in the March issue, and as advocated by Dr. Ottolengui some years ago, is not always a success. I allude to the method of drilling a hole just beneath the cusp surface of a shell crown, and then using a long instrument as a lever to pry it off. Twice within the past year, wishing to remove a gold crown with as little injury as possible, this lever method was adopted, with the result of fracturing the natural tooth, probably due to the adhesion of the cement, since, the fractured fragment came away with the crown. As we are unable to know the condition of the crowned teeth, I have arrived at the conclusion that the method is dangerous.

"I MAKE IT A RULE to apply the dam when treating roots, yet there are many cavities in upper teeth which may be so isolated and sterilized as to be absolutely safe to fill without the dam.

"I KNOW THAT YOU FELLOWS in New York are radical about filling every root before applying a gold crown, but I stand with Dr. C. N. Johnson, and do not believe it always necessary. Within a month I removed a six-tooth bridge from its attachment to a third molar, which the patient stated he had worn thirty years (having been once removed and repaired), and found the pulp still vital. Many similar cases have come under my observation, though of shorter duration."

OBSERVE THAT I have permitted Dr. Whipple to make three speeches without interruption. That is just a little sample of the sort of treatment all you fellows would get if you would just open up, and speak your little piece. Don't sit back and sulk when you read something in this department that you think you could criticize or improve on. If

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you knew a better way, tell it to the rest of us, and remember this: A statement is not unanswerable just because you see it in print, any more than your little narrative will be when we put that in print. That is why we are sitting around this fraternal table; so that we can talk to, and at one another.

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DR. WHIPPLE, for example, has not said the last word by any means. On the contrary he has started something, and I thank him for it. First though, he says that it is not always safe to drill a hole in a shell crown and use a long-handled instrument as a lever to pry it off. He says you might fracture the natural tooth. In fact, he knows that, because he has done it twice. That is what we want—the facts. Personally, I have never met such an accident, but as Dr. Whipple has, it must be possible, consequently we should be cautious.

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NEXT HE SAYS THAT some teeth in the upper jaw may sometimes be treated without the rubber dam. Oh, very well. So long as you do sterilize the root, and fill it aseptically, it matters little whether you use the rubber dam or some other dam way. (Notice to printer, no "n" in dam.) And I think it matters little to the patient either. I have been the patient, and know whereof I speak. I have had an upper tooth dammed up with two huge aseptic cotton rolls (sign of a red cross on the box), and a more or less comfortable clamp—principally less. And for my part I would have been just as happy, the tooth just as dry, and the rest of my mouth not so dry but more comfortable, if the rubber dam had been used.

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BUT I SAID that Dr. Whipple had started something. He started it when he said that the fellows in New York are radical. By the way I am not sure of that. A few are Bull Moose, but the majority here in Manhattan are Democrats—two varieties—Donkey and Tiger. Dr. Whipple says the New York fellows are radical because they fill all roots before they attach the bright and shining golden crowns. Honest, that is the nicest thing that has been said about the New York boys for a long time. Then he tells us that he stands with Dr. C. N. Johnson, (I am glad to hear that, because I am afraid Brother Johnson will need someone to lean on after that April Editorial of his is read by all the radiographers in the Club, or radiographers with a club, whichever way you prefer to put it), and that in his opinion, it is not always necessary to remove a pulp before placing a shell gold crown. Then he relates a real nice story about a bridge that rested one of its ends on a third molar for thirty years (which is ten years longer than the regular claimant usually claims for a good old-fashioned dental operation), and that the wise old wisdom tooth still lived to see the bridge swept away.

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CERTAINLY I AM not going to deny that a molar tooth may carry a crown for years and years and years, and still harbor a vital pulp. It is easy enough to make this discovery when the crown at last is removed. All one need do is to drill into the tooth, and if the pulp bleeds it probably

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was alive prior to the experimental puncture. But the difficulty is to know at the time when one is putting the bridge on, in the first place, whether or not the particular pulp about to be hidden under a bushel of gold, will live or die! Whether it will live happily if it does live, or whether it will live unhappily and grumble for years. Because my Thoughtful Diners, don't forget that a thing may be very vital and yet very diseased. Once upon a time, I tested this matter. I removed a number of shell gold crowns, which had been placed on living teeth, and I found—

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BUT THAT STORY will keep. Meanwhile, all you good fellows who have recently written to me asking for membership in the "Around the Table Club," just take up this proposition of crowning teeth with living pulps, and tell us your experiences and your opinions. That ought to make a good talk.

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MEANWHILE I have been to the great Illinois meeting. Naturally, I met Callahan. We were discussing him in New York you remember, last February. He took me over to the Blackstone Grill. He would have fed me at the "La Salle," only it was so crowded with dentists (5,000 wore badges), that it was not possible to have any private converse anywhere. And Callahan had a special secret to impart. This is it: "My dear boy," said Callahan. (He calls me his "dear boy" so that I will understand my own insignificance, and because, being a pseudo-Southerner, he thinks youth must respect age.) "My dear boy," said he. "You made a blunder in regard to that rosin preparation of mine. You printed it, 'Rosin twelve grains, Chloroform three ounces,' whereas it should have read, 'Rosin twelve grains, and Chloroform three fluid-drams.'" Well, of course he had the best of it. He knows the proportions better than I do, and as he made me return the original manuscript from which I copied it. I could not prove that it was his mistake, or his typewriter girl's mistake. But naturally I had to say something, so I said: "Don't let that trouble you Callahan. If the fellows put up the prescription as we printed it, just on a sudden impulse to buy something, even though they do have three ounces of chloroform to start with, by the time they use it the proportions will be about correct, because the chloroform evaporates and the rosin does not. Also, because it takes most men some time to abandon their own method to try another man's."

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CALLAHAN GASPED, by the time he grasped that, but before he recovered I had another little dagger for him. "By the way, Callahan," said I, "at the First District Meeting in New York, you showed us a fine set of specimens where you had filled the roots of teeth and then ground them down to the canals for examination. You told us you had used methylene blue with your rosin solution in order to determine whether or not the rosin solution had really penetrated the tubuli. Your specimens showed the blue stain extending in some places as far as the cementum. Dr. Nies of Brooklyn thinks you may be deceived, and that possibly your stain has penetrated farther than the rosin."

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DR. NIES writes as follows: "What I sought to prove is that while methylene blue will follow the free and combined watery moisture of the tooth and stain it, a rosin solution will not do so. Specimen No. 1 illustrates this. (A tooth filled with rosin solution, followed by a gutta percha cone. The stain has not passed beyond the canal walls.) No. 2 shows how methylene blue spreads when put in free, a point of gutta percha being put in on the following day. (This specimen shows the stain penetrating quite to the cementum in places.) I do not wish to be understood as saying that methylene blue can spread through dentine only in a watery solution.

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"I KNOW THAT carbolic acid does the same thing, for the following reason: I had a delicate patient who collapsed every time that I used cocaine, or painted her gum with aconite and iodine. This solution could not have carried more than a drop of aconite per application. Efforts to offset the action of these drugs with strychnine, used as an antidotal remedy, failed, so I tried forcing carbolic acid into the dentine with pressure, and was rewarded with an anesthesia that compared favorably with any cocaine solution I have ever used. I easily removed the pulp without discomfort to the patient. Later, to prove that the carbolic really passed through the dentine, I colored it with methylene blue, and with pressure forced it towards the pulp. After pressure for ten minutes I entered the pulp chamber and removed a blue pulp. This work was done on a molar, which I was about to crown."

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EVIDENTLY, though living in Brooklyn, Dr. Nies must be included among the radical New York boys, since he tells us that he removed the pulp of a molar before decorating it with a crown. This is only en passant, as we French would say.

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IS IT NOT ODD, how we drift from one subject to another in these table talks? We were on the topic of canal treatment, and without warning, as it were, we learn from Dr. Nies, that it might be possible to produce anesthesia of the pulp with carbolic acid and pressure. Some day, when you happen to be out of cocaine, and your druggist will not sell you any more without a prescription, and your office girl is out, and you don't know how to write the prescription yourself, I wish you would just try this carbolic acid proposition, and let the rest of us know what success you have.

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BUT NOW WE MUST NOT forget that Callahan is sipping his soda-water in the Blackstone Grill, and waiting for a chance to answer Dr. Nies. Here is Callahan's side of it: Said Callahan: "Dr. Nies spoke to me in New York about the tendency of the blue stain to out-travel its vehicle. He may be right, but he was using an aqueous solution under pressure, that pressure driving blood out of the blood vessels in the pulp tissues, and replacing the blood in part with the blue stain. The rosin solution is pushed into more or less empty tubules, the tubules supposed to be dry,

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❖ and furthermore, the vehicle carrying the blue (chloroform) is not a
❖ hydroscopic agent, and does not give up the stain in the presence of water.
❖ Witness, the stained teeth were ground on wet stones and since grinding
❖ have been washed many times.

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"I TRIED MANY STAINS and had just that trouble. For example—eosin.
❖ When the tooth, stained with eosin, is placed on a wet stone the stain
❖ will scatter all over the tooth, the whole tooth taking on the eosin color."

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"I DO NOT WISH to throw any cold water over this rosin proposition,"
❖ said I to Callahan, "and I hope you prove it to be the final and best
❖ method, because if ever a problem in dentistry needed final solving, it is
❖ root canal filling. But I do wish to ask one mean question. When you
❖ fill a root canal, out of the mouth with rosin solution and gutta percha,
❖ and then grind the root on a grind stone, does not that very grinding
❖ make the root filling seem better adapted to the canal, than it might have
❖ been before the grinding? And really you know Cal, we can't use a grind
❖ stone on the roots in the mouth to make the canal fillings fit better."

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"DON'T BE SILLY," said Callahan So I told him I would not. It would
❖ have been silly, I suppose, to press the question.

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"WELL, THEN," said I. "Here is another argument for you. I was talking
❖ over this rosin proposition with Dr. Taggart, in New York, at the
❖ Ritz-Carlton one afternoon, while we watched the partakers at a Thé
❖ Dansant, and ourselves partook of a couple of cups. ('Cups' is good, eh!
❖ What?) And Taggart told me that for years he had used Venice turpen-
❖ tine in canals, before introducing his gutta-percha point. He declared
❖ that he had had a bottle of Venice turpentine for years, and that it prac-
❖ tically does not alter in bulk, remaining in a semi-plastic condition, and
❖ as it has distinctly germicidal qualities, its plasticity and unchangeable
❖ characteristics in his opinion made it a useful adjuvant for root canal
❖ fillings in conjunction with gutta percha."

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ON THIS SAME general subject, Dr. Nies tells me that "Venice turpentine
❖ is a species of rosin from an Alps pine. So is Canada balsam a rosin.
❖ This substance has been used in Germany for many years as a root canal
❖ filling. Only in a slight degree do these pine rosins present any germi-
❖ cidal, antiseptic, dessicant or preservative qualities. They are only
❖ moisture proof. I sought in a synthetic combination of formaldehyde,
❖ cresol and mineral copal, an antiseptic root canal filling that might
❖ have the medicinal and physical qualities of those medicaments that had
❖ proven most successful in the hands of the profession.

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"I THINK THE MATERIALS that we use at present are not all that could
❖ be desired. We realize this when we remove a gutta percha point that
❖ has been in for a few years. These cones are frequently loaded with as
❖ much as 50 per cent. of zinc-oxide, talc or phosphate of calcium. It is
❖ the presence of these minerals that make the root filling visible in radio-

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graphs. I find the use of pure tin, finely pulverized, mixed in my solution, better defines the outlines of the root canal."

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"ONE OF THE POINTS that attracted my attention in your February talk," said Callahan, "was the remark made by the Chemist in relation to camphor. I have tried out all the rosins, and many other substances, including amber; also camphor. Nothing so far has proven so satisfactory in my hands as the rosin. As to copal, I have some experiments with that as well as other substances under way. Canada balsam looked good for some time, then lost its attractive features. It is the time test that counts. The rosin solution has made the best record for me in four years of testing. In my opinion formaldehyde has about as much of a place in a root canal filling, as has ground glass in a dentifrice."

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CHICAGO AND BROOKLYN papers please copy that last statement.

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Dr. John W. Moffit.

Died February 27, 1914, in Harrisburg, Pa., of old age, in his seventy-ninth year, John W. Moffit, D.D.S.

Dr. John W. Moffitt, a well-known pioneer of modern dentistry, and one of Nature's guileless gentlemen, has crossed to the Great Beyond.

He was the son of the Rev. John J. Moffitt, D.D., and Charlotte Eppley Moffitt; and was born at Orwigsburg, Pa., on June 5, 1835. Before he had attained his second year his father removed to the (then considered) far West, and settled in Ohio. Early dentists often combined two callings, and his father practiced dentistry in addition to attending to his ministerial duties.

Dr. John W. Moffitt received the usual school education of the time; and afterward attended Bethany College, Pennsylvania.

He early evinced an aptitude and enthusiasm for dental art. After a period of pupilage with his father, and also with Dr. Samuel Hullein, of Wheeling, Va. (now West Virginia), and thus being instructed in the then highly guarded mysteries of dental art and practice, he opened an office at Cadiz, Ohio, in 1853. Fond remembrance oft carried him back to his first plate, a silver one, because the patient was so satisfied with it, and another which followed shortly after, because the patient counted out fifty, separate, shining, one-dollar gold pieces therefor.

In 1855 Dr. Moffitt went on a trip through part of South America and the western part of the United States, and remained quite some time in California. Returning home late in 1857, he married and settled down to practice in Harrisburg, Pa. Since then, until prevented by the state of his health a few years ago, he continued in active practice, except during his service as a Union soldier in the Civil War. When under fire at the battle of Antietam he received orders to report at Hagerstown, Md., as an assistant hospital surgeon, and served in that capacity until honorably discharged in 1864.

Dr. Moffitt was one of our earliest porcelain specialists. Over sixty years ago he carved and baked porcelain blocks and teeth for his own

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use and that of the profession out of materials dug up and compounded by himself. Afterward he supervised the manufacture of teeth on a large scale for some of the early manufacturers, personally carving the models, and molding, casting and finishing the bronze molds, baking the teeth, and, in fact, doing everything necessary in tooth manufacture. He always was a strong advocate of high fusing porcelain.

Despite his love for the ceramic art, being an ardent disciple of Izaak Walton, he would leave a continuous gum case to catch a trout.

Ceramics was one of his hobbies. In 1860 he was awarded a patent for non-sectional block work baked on platinum. This he later abandoned to the profession through the Odontographic Society of Philadelphia. Another patent covered a tooth for continuous gum work as now practiced. He also obtained a patent for a tooth for rubber and plastic plates. Quite recently he introduced a method of attaching teeth to the platinum plate without soldering in continuous gum work.

The first bayonet-shaped forceps were made by a Philadelphia firm from a pattern cut out in wood and submitted by him; and many old forceps show his name imprinted thereon.

Dental flasks, adjustable articulators, separators, amalgam alloys, cements, and many other products of his genius have been manufactured; but his modesty and retiring disposition kept him from claiming the honors, and ofttimes emoluments, received by others therefrom. He was a veritable encyclopedia of means and methods in the preparation of dental necessities; and his fund of information was willingly shared with all.

Obturators and artificial vela were a most successful branch of his practice; and quite recently he made an ingenious and important improvement in the construction of the latter.

He did not often place his ideas in print, although a few articles, chiefly on porcelain subjects, appeared over his signature in dental journals.

He was one of the first delegates to the American Dental Association; and at its meeting at Nashville, Tenn., in 1870, represented the Pennsylvania State Dental Society. He was an officer and charter member of the Pennsylvania State Dental Society, the Lebanon Valley Dental Society, etc., and, in fact, outlived a number of societies in which he was once prominent. He was also a member of the Masonic fraternity.

Dr. Moffitt had a leading part in obtaining from the Pennsylvania Legislature the charter for the Philadelphia Dental College, in which he matriculated in 1864. He, however, did not present himself for examination for his degree until 1888, when he graduated. From the institution of this college he acted as demonstrator in prosthetics and porcelain,

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with some short intermissions, for over forty years; and hundreds of successful practitioners can look back gratefully to his instruction.

He was married in Harrisburg, Pa., on December 20, 1857, to Harriet R. Wenrick; but his entire family predeceased him. He is survived by a brother, R. H. Moffitt, D.D.S., now retired, and the latter's son, Dr. J. J. Moffitt, who is a member of the Pennsylvania State Dental Examining Board.

Interment was in Harrisburg Cemetery on March 2, 1914.

J. J. McL.

Dr. M. H. Fletcher.

When the Cincinnati Dental Society extends to the family of Dr. M. H. Fletcher its sympathy in their bereavement, it does so with a deep sense of its own loss at the passing away of one of its most beloved and inspiring members. The consolation in which the society takes refuge and which it begs the family of Dr. Fletcher to share, is the consciousness that his life was of unusual happiness, his professional career honorable and successful in the highest degree.

It was a privilege to have known so perfect a gentleman. The influence of his rare mind and character was widely felt. By its passing, not only the profession to which Dr. Fletcher contributed so much distinction, but the community at large has suffered a great loss.

The inspiration of his lofty ideals, the helpfulness of contact with such a master of the profession, the joy of companionship with a nature so genial, will be sorely missed by this society. But his memory will live long in the hearts of his brothers and will always be synonymous with the highest standards of excellence in conduct and in professional skill.

C. Stanley Smith,
J. R. Callahan,
Sidney J. Rauh,
Committee.

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National Society Meetings.

American Institute of Dental Teachers, Ann Arbor, Mich, January 28-30, 1915.
Secretary, Dr. J. F. Biddle, 517 Arch St., N. S., Pittsburgh, Pa.

National Dental Association, Rochester, N. Y., July 7-10, 1914.
Secretary, Dr. Otto U. King, Huntington, Ind.

American Society of Orthodontists, Toronto, Canada, July 2-3, 1914.
Secretary, Dr. Wm. Ernest Walker, 629-631 Maison Blanche, New Orleans, La.

Panama-Pacific Dental Congress, San Francisco, Cal., 1915.
Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

Canadian Dental Association, Winnipeg, Manitoba, May 26, 27, 28, 29, 1914.
Secretary, Dr. M. H. Garvin, 314 Somerset Blk., Winnipeg, Manitoba, Canada.

State Society Meetings.

Arkansas State Dental Association, Little Rock, Ark., June 4, 5, 6, 1914.
Secretary, Dr. C. L. Hunt, Fort Smith, Ark.

California State Dental Association and Southern California Dental Association, Yosemite Valley, Cal., June 29-30, July 1-2, 1914.
Secretary, Dr. E. E. Evans, Union Savings Bank Bldg., Oakland, Cal.

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COLORADO STATE DENTAL SOCIETY, Manitou, Colo., June 18-20, 1914.
Secretary, Dr. E. W. Spencer, 120 Pope Block, Peblo, Colo.

FLORIDA STATE DENTAL SOCIETY, Atlantic Beach, Fla., July 1-2-3, 1914.
Secretary, Dr. Alice P. Butler, Gainesville, Fla.

GEORGIA STATE DENTAL SOCIETY, Atlanta, Ga., June 4-6, 1914.
Secretary, Dr. M. M. Forbes, Candler Bldg., Atlanta, Ga.

INDIANA STATE DENTAL ASSOCIATION, Indianapolis, Ind., May 19-21, 1914.
Secretary, Dr. Otto U. King, Huntington, Ind.

IOWA STATE DENTAL SOCIETY, Des Moines, Iowa, May 5-7, 1914..
Secretary, Dr. C. M. Kennedy, Des Moines; Iowa.

LOUISIANA STATE DENTAL SOCIETY, Baton Rouge, La., June 4-6, 1914.
Secretary, Dr. E. B. Ducasse, Maison Blanche, New Orleans, La.

MAINE DENTAL SOCIETY, Augusta, Me., June 25-27, 1914.
Secretary, Dr. I. E. Pendleton, Lewiston, Me.

MASSACHUSETTS DENTAL SOCIETY, Boston, Mass., May 7-9, 1914.
Secretary, Dr. A. H. St. C. Chase, Everett, Mass.

MINNESOTA STATE DENTAL ASSOCIATION, Duluth, Minn., August 6-8, 1914.
Secretary, Dr. Benjamin Sandy, Syndicate Bldg., Minneapolis, Minn.

MISSISSIPPI DENTAL ASSOCIATION, Vicksburg, Miss., June 23-25, 1914.
Secretary, Dr. M. B. Varnado, Osyka, Miss.

MONTANA STATE DENTAL SOCIETY, Great Falls, Montana, June 11-12-13, 1914.
Secretary, Dr. F. W. Adams, 14-15 Chicago Block, Billings, Montana.

NEBRASKA STATE DENTAL SOCIETY, Lincoln, Neb., May 19-21, 1914.
Secretary, Dr. H. J. Porter, Cambridge, Neb.

NEW HAMPSHIRE STATE DENTAL SOCIETY, Weirs, N. H., June 17-19, 1914.
Secretary, Dr. Louis I. Moulton, Concord, N. H.

NEW JERSEY STATE DENTAL SOCIETY, Ocean Grove, N. J., July 15-18, 1914.
Secretary, Dr. John C. Forsyth, 430 E. State St., Trenton, N. J.

NEW YORK STATE DENTAL SOCIETY, Albany, N. Y., May 14-16, 1914.
Secretary, Dr. A. P. Burkhart, 52 Genesee St., Auburn, N. Y.

NORTH CAROLINA DENTAL SOCIETY, Hendersonville, N. C., June 24-27, 1914.
Secretary, Dr. J. Martin Fleming, Raleigh, N. C.

OHIO STATE DENTAL SOCIETY, Columbus, O., December 1-3, 1914.
Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

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PENNSYLVANIA STATE DENTAL SOCIETY, Phila., Pa., June 30, July 1-2, 1914.
Secretary, Dr. Luther M. Weaver, Phila., Pa.

TENNESSEE STATE DENTAL ASSOCIATION, Chattanooga, Tenn., June 4-6, 1914.
Secretary, Dr. C. O. Rhea, 625½ Church St., Nashville, Tenn.

UTAH STATE DENTAL SOCIETY, Logan, Utah, June 19-20, 1914.
Secretary, Dr. I. P. Stewart, 1st Nat. Bank Bldg., Logan, Utah.

VERMONT STATE DENTAL SOCIETY, Rutland, Vt., May 21-23, 1914.
Secretary, Dr. P. M. Williams, Rutland, Vt.

WEST VIRGINIA STATE DENTAL SOCIETY, Huntington, W. Va., August 12-14, 1914.
Secretary, Dr. A. C. Plant, 802 Schmulbach Bldg., Wheeling, W. Va.

WISCONSIN STATE DENTAL SOCIETY, Fond-du-Lac, Wis., July 14-16, 1914.
Secretary, Dr. O. G. Krause, Wells Bldg., Milwaukee, Wis.

National Dental Association.

The 1914 session of the National Dental Association will be held in Rochester, N. Y., July 7 to 10, 1914. The local committee has selected the Powers Hotel as headquarters and have made the other necessary arrangements for a large attendance.

This is the first meeting of the association under the reorganization and the House of Delegates, the governing body, will meet at 10:30 A. M., July 6th.

The officers and committees are expecting to present an exceptionally program, the details of which, together with the other arrangements, will appear in the later journals and the next number of our Official Bulletin.

HOMER C. BROWN, President,
Columbus, Ohio.

OTTO U. KING, General Secretary,
Huntington, Indiana.

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Southern Branch — N. D. A.

The 1914 meeting of the Southern Branch of the National Dental Association will be held in Atlanta, Ga., June 4th to 6th inclusive. The local committee of arrangements have selected the Hotel Ansley as headquarters and have the other necessary arrangements made for this meeting. The officers and committees are planning to present an exceptionally interesting program, the details of which, together with the other arrangements, will be presented in later journals.

JESSE L. WILLIAMS, Cor. Secretary.
Jacksonville, Fla.

W. A. DEAN, President,
Tampa, Fla.

American Medical Association Section of Stomatology.

The annual meeting of the American Medical Association will be held at Atlantic City, June 22 to 26, 1914.

PROGRAM FOR THE SECTION OF STOMATOLOGY.

TUESDAY 2:00 P. M.

1. Chairman's Address.....Dr. William C. Fisher, New York
2. Mesothelial Tumors of the Jaw....Dr. Robert H. Ivy, Philadelphia
   Discusser: Dr. Robert P. Bay, Baltimore.
3. Cystic Tumors of the Jaw.....Dr. Gorden New, Rochester
4. Differential Diagnosis of Major Mouth Lesions,
   Dr. Stewart L. McCurdy, Pittsburg
5. The Methods of Obtaining Dental Service in Hospitals by the Appointment of Internes.....Dr. Herbert L. Wheeler, New York

WEDNESDAY 2:00 P. M.

6. What Shall be the Content for a Course in Oral Surgery in Our Dental Schools.....Dr. A. H. Levings, Milwaukee, Wis

DISCUSSERS:

a. Dr. Geo. V. I. Brown.....Milwaukee
b. " Thomas Gilmer .....Chicago
c. " F. B. Moorehead .....Chicago
d. " M. I. Schamberg.....New York City
e. " J. A. Pettit.....Portland, Ore.
f. " Vilray P. Blair.....St. Louis
g. " M. H. Cryer.....Philadelphia
h. " James G. Sharpe.....San Francisco

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THURSDAY 9:30 A. M.

7. The Scientific Routine of Tooth Brushing and Mouth Cleaning .....Dr. Joseph Head, Philadelphia
8. Osteoplastic Surgery of the Face....Dr. Wayne W. Babcock, Phila
9. Fractures of the Inferior Maxilla..Dr. Henry S. Dunning, N. Y. C.
10. Bacteriology of Alveolar Abscess.....Dr. Thomas Gilmer, Chicago
11. Acute Parenchymatous Glossitis.....Dr. Virgil Loeb, St. Louis
12. The Section of Stomatology as a Factor in the Evolution of Dental and Medical Science...Dr. Geo. V. I. Brown, Milwaukee

THURSDAY 2:00 P. M.

13. Mouth Infection as a Source of Systemic Disease, Dr. Frank Billings, Chicago

DISCUSSERS:

a. Dr. Edward C. Rosenow.....Chicago
b. " Charles H. Mayo.....Rochester
c. " Victor C. Vaughn.....Ann Arbor, Mich.
d. " Charles L. Mix.....Chicago
e. " Daniel H. Squire.....Buffalo
e. (The Peridental Membrane as a Source of Infection.)
f. Dr. C. B. Craig.....New York
f. (Mouth Infection in Relation to Nervous Affection.)

We are exceptionally fortunate in having on the program of this meeting the gentlemen whose original work has correlated certain systematic diseases with mouth infections.

An effort will be made to harmonize the different methods of teaching oral surgery in our dental schools, and to formulate a comprehensive scheme for a uniform course of instruction.

A very attractive program is here offered and those who are interested are cordially invited to be present and take part in the discussions.

EUGENE S. TALBOT, Secretary.

Vith. International Dental Congress. (London.)

Section X: Dental Education.

The subjects for report to be followed by discussion are:

(1) "The Teaching of Bacteriology for Dental Students," "Methods of Teaching," "Extent of Teaching." Reporters—Mr. J. Howard Mummery and —— ——————.

(2) "A Practical Synopsis of Medical and Surgical Teaching for Dental Students." Reporter—Dr. Godon.

(3) "First Principles in Practical Teaching." Reporter—Dr. Gaddes.

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(4) "Methods of Teaching Orthodontics to Dental Students." Reporters—Dr. Guilford and Dr. Martinier.

The mornings of the 5th, 6th and 7th of August to be devoted to reports and the afternoons to independent papers.

The committee of the section is desirous of obtaining names of gentlemen willing either to discuss the above subjects, or to read papers on "Dental Education."

F. Bocquet Bull,
Guy's Hospital, London, E. C.,
George Sheppard,
59 Merrion Square, Dublin,
Honorary Secretaries.

Northern Ohio Dental Association.

The fifty-seventh annual session of the Northern Ohio Dental Association will be held at the Wigmore Coliseum, Cleveland, Ohio, Thursday, Friday and Saturday, June 4, 5 and 6, 1914.

C. D. Peck, Secretary.

Graham Building, Sandusky, Ohio.

Georgia State Dental Society.

The forty-seventh annual meeting of the Georgia State Dental Society will convene at the Ansley Hotel, Atlanta, Ga., June 4, 5 and 6, 1914, beginning Thursday, June 4th at 10:00 A. M.

The Southern Branch of the National Dental Association will meet in connection with the Georgia State Society, and excellent papers will be read and clinics given.

All ethical practitioners are extended a cordial invitation. Any further information cheerfully furnished by the secretary.

Dr. M. M. Forbes, Secretary.

303-4 Candler Building, Atlanta, Ga.

Massachusetts Board of Registration in Dentistry.

A meeting of the Massachusetts Board of Registration in Dentistry will be held in Boston, Mass., June 3, 4 and 5, 1914. For applications and other information apply to

Dr. G. E. Mitchell, Secretary.

14 Water Street, Haverhill, Mass.

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Southern California Dental Association.

The seventeenth annual session will be held June 29th, 30th, and July 1st and 2d, in the Yosemite Valley, in conjunction with the California State Dental Association.

This joint meeting is planned by the officers of the two associations to afford an opportunity for the members to become better acquainted with one another, and as a get-together meeting in the interest of the great Panama-Pacific Dental Congress, to be held in San Francisco, August 30, 1915.

An excellent program of papers, clinics and exhibits is being prepared, but "shop" will be so regulated as not to interfere with the social, sight-seeing and general vacation features that the environment of the Yosemite Valley offer.

Montana State Dental Society.

The Montana State Dental Society will meet in Great Falls, Montana, June 11, 12 and 13, 1914.

F. W. ADAMS, Secretary.

Billings, Montana.

North Carolina State Board of Dental Examiners.

The next regular meeting of the North Carolina State Board of Dental Examiners will be held at Hendersonville, N. C. Beginning promptly at 9:00 A. M. on Monday, June 22, 1914. All applications must be in the hands of the secretary not later than June 15th. For further information and application blanks address the secretary.

DR. F. L. HUNT, Secretary.

Asheville, N. C.

Arkansas State Board of Dental Examiners.

The next meeting of the Arkansas State Board of Dental Examiners will be held at the Marion Hotel, in Little Rock, Ark., on June 8th and 9th.

Application and fees should be filed at least ten days prior to date set for examination.

For future particulars address

I. M. STERNBERG, D.D.S., Secretary.

Merchants National Bank Building,
Fort Smith, Ark.

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The Florida State Dental Society.

The Florida State Dental Society will hold its annual meeting at Atlantic Beach Hotel, Atlantic Beach, Fla., July 1st, 2d and 3d.

All ethical dentists are invited to attend. Any other information will be gladly furnished by

ALICE P. BUTLER, Cor. Secretary.

Gainesville, Fla.

Iowa State Board of Dental Examiners.

The next meeting of the Iowa State Board of Dental Examiners for the examination of candidates will be held at Iowa City, commencing at 9:00 A. M., June 1, 1914. For application blanks and particulars write

J. A. WEST, Secretary.

417 Utica Building, Des Moines, Ia.

Vermont State Board of Dental Examiners.

The next meeting of the Vermont Board of Dental Examiners, for the examination of candidates to practice in Vermont, will be held at the State House, Montpelier, June 29, 1914, continuing three days, commencing at 2 o'clock P. M., June 29th.

To be eligible for examination a candidate must first be twenty-one years of age; second, must be a graduate of a high school of the first class; third, must be a graduate of a reputable dental college.

Applications must be in the hands of the secretary not later than June 20th. For further information apply to

GEORGE F. CHENEY, Secretary.

St. Johnsbury, Vt.

Illinois State Board of Dental Examiners.

The semi-annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the State of Illinois, will be held at the Northwestern Dental School, 31 West Lake Street, Chicago, Ill., beginning Thursday, June 11, 1914, at 9 A. M. All applications, together with fees, twenty-six dollars ($26) must be filed with the secretary at least five (5) days prior to date of examination.

Address all communications to

O. H. SEIFERT, Secretary.

305-6-7-8 Ridgely Bank Bldg., Springfield, Ill.

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National Association of Dental Examiners.

The thirty-second annual session of the National Association of Dental Examiners will be held at the Rochester Hotel, Rochester, N. Y., beginning July 6th at 10 A. M. and continuing until adjournment.

Every State Board holding membership in the association is earnestly requested to have at least one representative present at this session. Members of all State Boards are invited.

Hotel reservations should be made immediately, as the National Dental Association meets in Rochester during the week beginning July 6th, and the attendance undoubtedly will be large.

T. A. Broadbent, Secretary,
15 E. Washington Street, Chicago, Ill.

A. E. Honey, President,
Kalamazoo, Mich.

Florida State Board of Dental Examiners.

The Florida State Board of Dental Examiners will meet June 26, 27, 29 and 30, 1914, in Jacksonville.

All applicants must come prepared to put in one gold and one amalgam filling in the mouth, make one post crown, and set up upper and lower set of teeth on anatomical articulator.

Articulators, models, blowpipes and gas appliances furnished by the board.

Applicants must exhibit diplomas from reputable dental schools. Secretary would like to meet all applicants at the Seminole Hotel at eight o'clock on the evening of June 25, 1914. Fee $25.

W. G. Mason, Secretary.

Tampa, Fla.

Board of Dental Examiners of Alabama.

The Board of Dental Examiners of Alabama will meet at Selma, Ala., on the morning of June 2, 1914.

Examinations will be both theoretical and practical. All theoretical examinations must be in writing.

Applicants must be twenty-one years of age, of good moral character, and must present to the board diploma or satisfactory evidence that he or she has graduated in dentistry at some college of dentistry recognized by National Association of Dental Faculties.

W. J. Reynolds, Secretary.

Parrish Building, Selma, Ala.

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Dental Commissioners of Connecticut.

The Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Thursday, Friday and Saturday, June 18, 19 and 20, 1914, to examine applicants for license to practice dentistry. Application blanks, rules, etc., will be forwarded by the recorder on request.

By order of the Commission.

EDWARD EBERLE, Recorder.

902 Main Street, Hartford, Conn.

Indiana State Board of Dental Examiners.

The next regular meeting of the Indiana State Board of Dental Examiners will be held in the State House, at Indianapolis, beginning June 15th and continuing five days. For further information and blanks, address

F. R. HENSHAW, Secretary.

507 Pythian Building, Indianapolis, Ind.

Reading Dental Society.

The entire membership of the Reading Dental Society joins the National Body.

At the April meeting of the Reading Dental Society it was moved and carried that the Reading Dental Society give expression of its faith in, and support of, the work of the National Association by joining that body with its entire membership.

The secretary was instructed to forward a check of $38 to the National Association as our dues for the year 1914.

Believing the above information will be helpful to the cause, we submit the same for publication in your journal.

Signed,

GEO. F. DELONG,
C. R. SCHOLL,
Press Committee of the Reading Dental Society.

CHAS. C. NOBLE,
WELLSLAKE D. MORSE,
W. W. MCCOLLUM,
Publicity Committee.

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Bacteriology in its Relationship to the Oral and Nasal Cavities.

By John Bethune Stein, M.D.
Professor of Physiology and Histology at the New York College of Dentistry, New York.

II.

Gonococcus or Diplococcus Gonorrhoeae.

The Gonococcus or Diplococcus Gonorrhœae of Neisser (1879) (Fig. 14) is the causal agent of gonorrhœa. It has been found in urethral and vaginal pus, in the complications of gonorrhœa; bartholinitis, salpingitis, metritis, peritonitis, cystitis, suppurative nephritis, and in gonorrhœal ophthalmia. By its passage into the blood it produces a true septicemia (Hallier, Krause). It has been discovered, by Ghon and Schlagenhaufer, Thayer and Lazear, Rendu and Hallé, Berg, Lartigau, in the lesions of gonorrhœal endocarditis, and by Petrone and Kammerer in the pus from gonorrhœal arthritis. It is not usual to find it in the serous effusion of rheumatic joints as it rapidly disappears from the exudation, but it has been observed in cultures made from the granulation tissue in these situations, as it may remain alive for a long time in the articular tissues (Vaquez). Bressel has recognized it in a case of pneumonia developing during the decline of an attack of gonorrhœa. The gonococcus has also been found in the cerebrospinal fluid from a case of cerebrospinal meningitis following an attack of gonorrhœal urethritis (de Jong). In the early stages of

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gonorrhœa the gonococcus is usually the only micro-organism present, but later on other micro-organisms, colon bacilli, pus-forming micro-organisms, diplococci, etc., associate themselves with or take the place of the gonococcus. These other micro-organisms may produce the various complications of gonorrhœa, viz., the abscesses, various inflammations, endocarditis, etc.

The gonococcus is afforded ample occasion to infect the mouth by objects (the fingers, eating and drinking utensils, etc.), which have been contaminated by gonorrhœal discharges and exudates, coitus per os, cunnilingua, and the exudates of a gonorrhœal ophthalmia passing

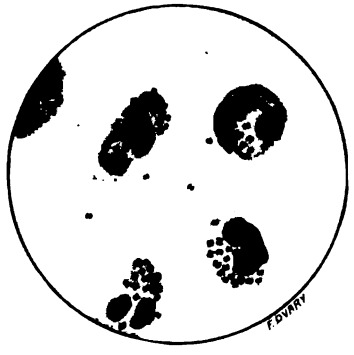


Fig. 14.

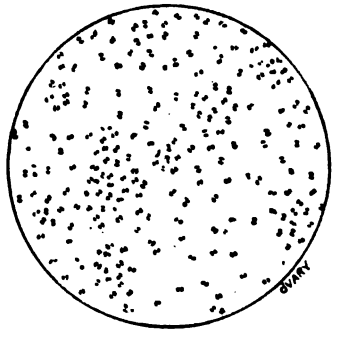


Fig. 15.

Fig. 14. Gonococcus in the Purulent Exudate of an Acute Gonorrhœal Urethritis. × 1000. Most of the Gonococci are seen as Cell Inclusions of the Leucocytes (Phagocytes).

Fig. 15. Meningococcus. From a Pure Culture. × 1000. (Modified from Kolle and Hetsch.)

through the nasal duct into the nose and thus into the pharynx and mouth. The attempts by Diday to infect the nasal mucous membrane by discharges from cases of acute urethritis proved absolutely futile.

Some writers claim the disease has been proved to exist in children. According to Dr. Victor Mucha, Docent at Finger's Clinic in Vienna, a case of gonorrhœal stomatitis has not been seen at Finger's Clinic during the past sixty years, and there has never been a case recorded in the obstetric clinic, pediatric clinic, or foundling asylum in Vienna.

The morphological resemblance of the gonococcus to the following organisms which are to be found in and about the mouth is extremely close, viz., Meningococcus, Micrococcus catarrhalis, Diplococcus pharyngis siccus, Micrococcus cinereus, Diplococcus pharyngis flavus I-II-III. All of these eight micro-organisms are Gram negative; therefore, it is only posible to differentiate them by cultural methods. From these facts it can be seen how difficult is the diagnosis of gonorrhœa of the mouth.

In a recently reported case where an individual who had coitus per

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os with one who had an acute gonorrhœal urethritis, shortly afterward developed a stomatitis, the diagnosis of gonorrhœal stomatitis was made. but apparently upon the sole basis and authority of the *"post hoc ergo propter hoc."*

The suspected gonorrhœal stomatitis cases may be grouped as follows:

(1). Cases reported before the discovery of the gonococcus.

(2). Cases where only a microscopical examination was made and the exudate revealed a micro-organism which resembled the gonococcus in its morphological, staining, and grouping characteristics.

(3). Cases where, in addition to the microscopical examination, cultures upon agar and serum agar, were made in order to find the suspected micro-organism, the findings proving the presence of an organism resembling the gonococcus.

(4). Cases where, in addition to the microscopical examination and cultivation of the suspected micro-organism upon agar or serum agar, proving its resemblance to the gonococcus, the suspected micro-organism when grown, upon von Lingelsheim's sugar-litmus-serum-agar-media shows the essential characteristics of the gonococcus.

In the diagnosis of gonorrhœal stomatitis we may invoke the *"post hoc ergo propter hoc"* theorem, but we must also demonstrate the morphological, staining, grouping, and ordinary cultural characteristics of the gonococcus, and then verify our conclusion by the use of the sugar-litmus-serum-agar-media of von Lingelsheim.

From a careful review of the literature on the subject and from personal investigations the writer is convinced, that the occurrence of gonorrhœa of the mouth has not been proved.

Meningococcus. The Meningococcus of Weichselbaum (1887) or the Diplococcus Intracellularis Meningitidis (Fig. 15) is the most frequent cause of epidemic cerebrospinal meningitis. It has predominated notably in recent epidemics. In certain cases of meningitis, the cerebrospinal fluid contained a micro-organism of the pneumococcus type (Wolf, Netter). Jaeger and Heubner have studied in an epidemic of cerebrospinal meningitis a micro-organism, saprophytic in the pharynx, which is identical with the Diplococcus crassus, but sharply differentiated from the Meningococcus. Bonome has described a capsulated Gram positive Streptococcus, which is usually associated with the Meningococcus, as the casual agent of epidemic cerebrospinal meningitis, and Netter and others have found this micro-organism in many cases of meningitis. The Meningococcus is found in the exudates of the meninges and in the cerebrospinal fluid; at times it passes into the blood of patients with meningitis (Salomon, Elser,

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Sacquépée). Strümpell, Weigert, Albrecht and Ghon, Kiefer and Jundell have shown that a more or less marked rhinitis and pharyngitis is caused by the Meningococcus. According to Ostermann this rhino-pharyngitis is contagious and disseminates the Meningococci. Some individuals suffering from a pharyngitis caused by the Meningococcus escape the meningitis, the meningitis only declaring itself when the Meningococcus, following conditions at present poorly determined, leaves the nose and pharynx to invade the cerebral meninges. During the course of an epidemic of cerebrospinal meningitis a careful examination of the nose and pharynx is of the greatest importance as a patient may be

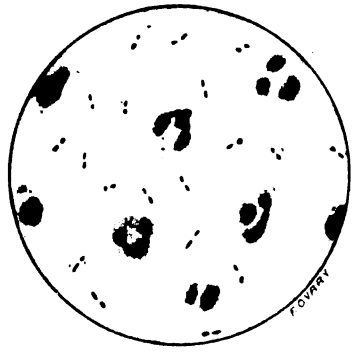


Fig. 16.

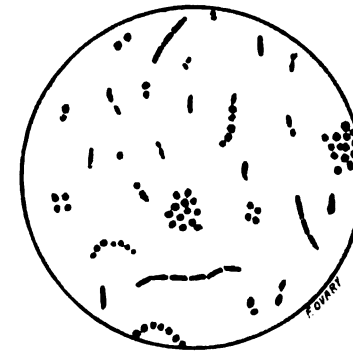


Fig. 17.

Fig. 16. Pneumococcus in Sputum. × 800.

Fig. 17. Micrococcus Enteritis or Enterococcus of Thiercelin. (A Polymorphic Micro-organism.) × 700.

the *"carrier"* of the Meningococci in his nose and pharynx and an active agent in the dissemination of meningitis, of which he is apparently free It is estimated by Bruns and Hohn that there are ten to twenty times as many *"carriers"* of the Meningococcus as there are persons afflicted with meningitis. The Meningococcus remains in the nose and pharynx on an average of fifteen days; but, it may remain several months.

The following facts are among some of the most important bearing upon preventive medicine, viz.:

(1). That pathogenic micro-organisms may invade the human body without causing disease and that they may be found in the body and dejecta of apparently healthy persons who have never had the disease caused by these micro-organisms.

(2) That pathogenic micro-organisms may be found in the dejecta either of those who are convalescing from a disease or of those who have recovered entirely from a disease contracted months or even years before.

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This discovery is the outcome of Pfeiffer's observations made upon cholera patients and apparently healthy persons who were exposed to cholera during an epidemic of Asiatic cholera in Russia in 1905.

An apparently healthy person in whom or in whose dejecta pathogenic micro-organisms could be found the German bacteriologists call a "Bazillenträger or Dauerauscheider." We call such a one either a chronic or latent "*carrier*" of pathogenic micro-organisms (Bacillus-carrier).

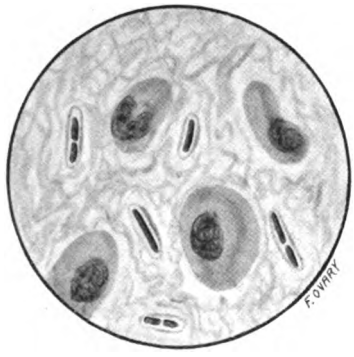


Fig. 18.

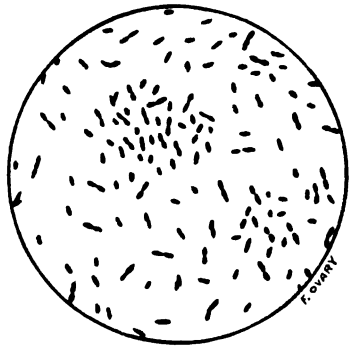


Fig. 19.

Fig. 18.. Pneumobacillus in Sputum. ×1000.
Fig 19. Bacillus Lactis Aërogenes. × 700.

Micrococcus Catarrhalis.

During the last few years Pfeiffer, Bernheim, Petruchsky, Ghon and others have described the existence in certain lesions of the respiratory tract of a diplococcus similar to the Gonococcus in its morphology and in that it is Gram negative. It is called the Micrococcus Catarrhalis, is frequently found in bronchitis, pneumonia and the sputum of febrile tubercular patients, and closely resemble the Meningococcus.

Pneumococcus.

The Pneumococcus (Streptococcus Lanceolatus, Diplococcus Pneumoniæ, Micrococcus Pasteuri) (Fig. 16) causes Lobarpneumonia (Talamon, Fränkel, Weichselbaum) and a large number of the complications of pneumonia and certain other diseases. It is frequently found in the saliva (Pasteur (1881), Sternberg (1880), Fränkel (1886), Bürger), and habitually in the mucus from the tonsils of healthy persons (Bezançon, Griffon). Bürger has recognized it 34 times in 100 in the oral cavity of healthy individuals. Park and Williams have found the Pneumococcus (40 times in 80) in the mouth, nose and throat of healthy persons. Netter has found this micro-organism on an average of four times out of five in subjects who have had pneumonia and once in five

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in those who never had the disease. He also states that during the course of the disease the saliva is infectious and that this condition disappears at the crisis to reappear on the fifteenth day. The Pneumococcus appears as an inoffensive parasite in the mouths of healthy persons: if, however, the resistance against micro-organism is weakened for some cause or other, it triumphs over the protective influence of the phagocytes and invades the lung.

Pasteur (1880) produced in rabbits a so-called "sputum septicemia" by inoculating them with normal human saliva. He named the micro-organism found in this form of septicemia the *"Microbe Septicémique du Salive."* It was doubtless the Pneumococcus. The Pneumococcus always exists in the hepatized foci of lobarpneumonia either alone or associated with other micro-organisms, especially the Streptococcus, the Staphylococcus pyogenes and the Bacillus of Friedländer. It is met with in the rusty sputum, and certain forms of bronchopneumonia appear to be caused by it. It may pass into the blood thereby causing neighboring or distant complications, at times, of a suppurating character. The Pneumococcus produces a greenish, thick, viscid pus, very rich in cellular elements and the inflammatory processes caused by it have a tendency to heal. The Pneumococcus is sometimes a causal agent of the following complications of pneumonia, viz., a fibrinous, or purulent pleurisy or pericarditis, a vegetative or ulcerative endocarditis, meningitis, nephritis suppurative parotitis, suppurative arthritis, peritonitis, metritis and abscesses. But the complications of pneumonia may be caused by other micro-organisms of suppuration. It is possible for the Pneumococcus to produce as a primary disease, without any pneumonia, a fibro-purulent pleurisy, a sero-fibrinous or suppurative pericarditis (Osler, Banti), conjunctivitis, keratitis, suppurative otitis (Zaufal, Netter), ulcerative endocarditis (Jaccoud, Netter, Weichselbaum), pharyngitis, simple or membranous (Cornil, Jaccoud, Menetrier, Rendu, Boulloche), peritonitis and suppuration of the bile passages. It causes a large number of cases (primary) of meningitis of the cerebrospinal type. Netter has found the Pneumococcus in 18 out of 31 cases of meningitis which were not accompanied or followed by pneumonia, and Foa and Landouzy have also observed the Pneumococcus in certain types of cerebrospinal meningitis. Marchoux has described an epidemic of meningitis of the cerebrospinal type with pneumonia among the negroes of Senegal; the meningitis caused by the Pneumococcus occurring at the same time as the pneumonia.

Diplococcus of Infectious Parotitis.

A Diplococcus has been found by Laveran and Catrin in the blood, parotid gland and testes of 62 out of 92 patients suffering from infectious parotitis (Mumps). In 2 of these 92 cases they found the

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diplococcus in the exudate obtained from the arthritis. Korentschewsky obtained this micro-organism in the exudate from the parotid gland in 28 out of 29 cases examined, and in the blood in 8 cases out of 32. Isabella Herb succeeded in isolating a diplococcus from a case of mumps and makes the following suggestive statement: "Inoculations of suspensions of the diplococcus into Steno's duct in the monkey and in the dog produce an acute, uniform enlargement of the parotid gland, accompanied with some slight fever. In the dog this enlargement is the result of an infiltration that consists largely of mononuclear cells, and is accompanied

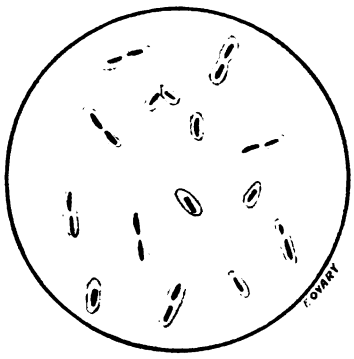


Fig. 20.

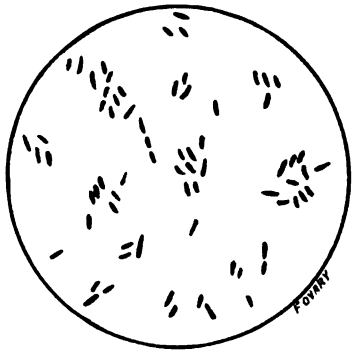


Fig. 21.

Fig. 20. Bacillus of Rhinoscleroma. × 1000. (Modified from Besson.)
Fig. 21. Bacillus Pyocyaneus. × 800.

with a general increase in the mononuclear cells in the blood, as well as a distinct rise in the opsonic index with respect to the diplococcus."

Micrococcus Enteritis.

The Micrococcus Enteritis, Enterococcus of Thiercelin (1889) or Streptococcus Enteritis of Escherich (1889) (Fig. 17) is a saprophytic micro-organism which may become pathogenic. It is met with in the digestive tract, the mouth, nose, pharynx, under the skin and in the vagina. It plays an important rôle in enteritis in the adult and child, in infections of the gall bladder and biliary ducts; produces complications in typhoid fever and tuberculosis and may be the cause of meningitis and bronchopneumonia.

Pneumobacillus.

The saliva of many healthy individuals (according to Netter, 4½ per cent.), contains the Pneumobacillus of Friedländer (1883) (Fig. 18) which, if not the causal agent of pneumonia as Friedländer believed, nevertheless plays an important part in pathology. It is met with in bronchopneumonia, meningitis, pleurisy, pericarditis, and peritonitis; causes septicemia (at times hemorrhagic), and many forms of suppuration, such as stoma-

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titis, parotitis, otitis, frontal and maxillary sinusitis, dacryocystitis, orchitis, epidydimitis, perineal abscesses, endometritis, and some forms of pseudomembranous pharyngitis (Nicolle, Hebert), and may be associated with the Bacillus diphtheriæ. It has been found in the air, dust and certain waters.

Bacillus Lactis Aërogenes.

The Bacillus Lactis Aërogenes (Escherich) (Fig. 19), a species of Pneumobacillus (Denys and Martin, Grimbert and Legros, and Bertarelli), is found in the air, soil, water and feces and produces



Fig. 22.



Fig. 23.

Fig. 22. Streptobacillus of Ducrey and Leucocytes, in the Exudate from a Chancroid. × 1000.

Fig. 23. Bacillus of Diphtheria, Leucocytes, Erythrocytes, Streptococci, and Staphylococci in the Exudate of Diphtheria. × 700.

fermentation of milk. It appears to cause enteritis in nursing infants and plays an important rôle in infections of the genito-urinary tract.

Bacillus of Rhinoscleroma.

The Bacillus of Rhinoscleroma (Fig. 20), discovered by von Frisch, has been seen in pharyngeal and nasal lesions, and Rona has found it in the submaxillary lymph nodes complicating a case of rhinoscleroma. This microorganism is closely related to the Pneumobacillus.

Bacillus of Ozena.

The Bacillus of Ozena (discovered in the mucous secretions in cases of ozena by Löwenberg), can be identified with the Pneumobacillus, and is no longer considered the causal agent of ozena.

Bacillus Pyocyaneus.

The Bacillus Pyocyaneus (Gessard, 1882), (Fig. 21), is the cause of the blue or green stains in surgical dressings quite frequent before the days of antiseptics, but rare to-day. It is usually associated,

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in the "blue or green pus" with other micro-organisms of suppuration, and may invade the tissues of the body when a pre-existing disease offers a port of entry.

Lartigau says: "The Bacillus Pyocyaneus, like many pathogenic micro-organisms, is occasionally found in a purely saprophytic rôle in various situations in the human economy. It has been found in the saliva by Pansini, in sputum by Frisch and in the sweat by Eberth and Audanard. Abelous demonstrated its presence in the stomach as a saprophyte. Its existence in suppurating wounds has long been known and Koch early detected its presence in tuberculous cavities, regarding it as an organism incapable of playing any pathological rôle."

There are those who hold that even if this bacillus is found in the purulent exudate from open wounds and certain cavities (nasopharynx and maxillary sinus), its action is only localized and it does not cause a true infection. There are also those who believe the infection by the Bacillus Pyocyaneus is but an agonal or terminal one.

The Bacillus Pyocyaneus has been found in otitis media, pseudo-membranous pharyngitis, bronchopneumonia, enteritis, appendicitis, diarrhœa of infants, colitis, urinary infections, cutaneous lesions, meningitis, the blood of persons suffering from chronic colitis and organs of typhoid patients. A general infection with this bacillus is described a number of times.

The micro-organism is present in dust, water and the soil. Besson reports that the waters of Tunis contain it and that suppurations and grave complicating infections are caused by it in that country.

Jordan states that: "On the whole, there is no doubt that under certain conditions the Bacillus Pyocyaneus is pathogenic, even gravely so, for man."

Streptobacillus of Ducrey.

The Streptobacillus of Ducrey (1889), (Fig. 22), found in the pus of chancroids, is usually associated with the Staphylococcus, Micrococcus tetragenus, Gonococcus, and Bacillus cutis communis of Nicolle. It is to be seen between the fibrils of the connective tissue of the dermis, and does not enter the cells or blood vesse'ls. As repair of tissue takes place it appears within the leucocytes and its virulence seems to diminish as cicatrization progresses. The inoculation of man with pus from chancroids or with cultures of the bacillus produces a typical chancroid. Extragenital chancroid is very rare and buccal or pharyngeal still rarer. Aside from the doubtful cases of chancroid of the mouth reported by Ricord, Diday and Kaposi, there are some which cannot be doubted, among which are two cases recently reported by Droulle and Gaucher. The most frequent situation in or about the mouth for the

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chrancroid which may be simple or multiple, is on the tongue anterior pillars of the fauces and soft palate.

Bacillus Diphtheriae.

The Klebs-Löffler-Bacillus (1883-1884), the Bacillus Diphtheriæ (Fig. 23), is found in man in the false membranes of diphtheria (pharyngeal, nasal, laryngeal, cutaneous diphtheria). It may produce a pharyngitis without a false membrane, in which case a bacteriological examination must be made to diagnose the case. *In every case where diphtheria is suspected a cultural and microscopic examination should at once be made.* As a rule, this micro-organism is found only on

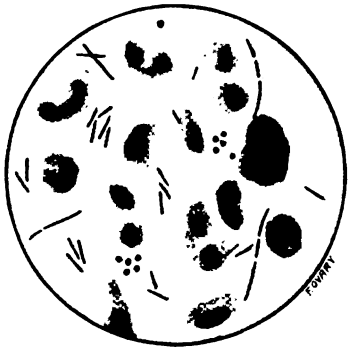


Fig. 24.

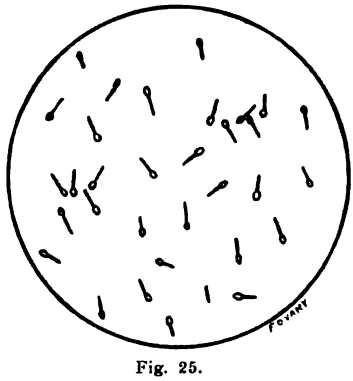


Fig. 25.

Fig. 24. Bacillus of Tetanus, Leucocytes and Cocci in a Purulent Exudate from a Guinea Pig Inoculated with Garden Earth. × 700.

Fig 25. Bacillus of Tetanus Containing Spores. × 700.

the mucous membrane or in the false membrane, it rarely invades the tissues of the body, but it has been found in the blood and viscera of cases coming to autopsy. (Babès, Spronck, Paltauf, Frosch, Kutscher, Barbier and Tollemer, Nowak.) It has been frequently encountered in the foci of bronchopneumonia secondary to croup (Löffler, Kutscher).

The presence of the Bacillus Diphtheriæ has been determined in the mouth and nasal cavities of those—*"carriers"*—who had diphtheria. sometimes several weeks after recovery. Although denied by several bacteriologists, Besson states, that numerous observations seem to prove the existence of the Klebs-Löffler bacillus in the mouths of healthy persons—*"carriers"*—who have never come in contact with those known to have been suffering from diphtheria.

In 1884, about the same time when the Bacillus Diphtheriæ was discovered, that keen student of medicine, Abraham Jacobi, recognizing that diphtheria often presented itself in such a mild form that its diagnosis was difficult or impossible, said:

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"The symptoms are often but few; a little muscular pain and difficult deglutition are, perhaps, all that is complained of; women will quietly bear it; men will go about their business. There is as much diphtheria out of bed as in bed; nearly as much out of doors as in doors. Many a mild case is walking the streets for weeks without caring or thinking that some of his victims have been wept over before he was quite well himself. Diphtheria is contagious. Severe forms may beget severe forms or mild forms. Mild cases may beget mild or severe cases."

The Bacillus Diphtheriæ may exist for a long time outside of the body. Park, Wright and Emerson have observed it in the dust of wards



Fig. 26. Bacillus of Tetanus Showing Flagella. Highly Magnified. (From a Photomicrograph Taken by Tavel.)

where diphtheritic patients were treated and on the clothes of their attendants; and Abel has shown it to be on toys which had been in the hands of a child who had diphtheria.

Pseudo-Diphtheria Bacillus.

There is found in the mouths of healthy persons (72 in 362 children examined by Graham-Smith) a non-virulent micro-organism, the Bacillus of Hoffmann or Pseudo-Diphtheria Bacillus. It has been seen in cases of non-diphtheric pharyngitis. Löffler, Hoffmann and Spronck consider it a distinct micro-organism, whereas Roux and Yersin insist that the Pseudo-Diphtheria bacillus is only an avirulent form of the Klebs-Löffler bacillus.

Corynebacteria.

German bacteriologists have grouped together several bacilli, which they call the Corynebacteria, characterized by intra-protoplasmic granules, club-like swellings on their ends and the property of producing ramifying forms in old cultures. These are: (1) Corynebacterium Diphtheriæ (Bacillus Diphtheriæ). (2) Corynebacterium Commune (Pseudo-Diphtheria Bacillus or Bacillus of Hoffmann). (3) Codyne-

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bacterium Conjunctivæ (Bacillus Xerosis). (4) Corynebacterium Mallei (Bacillus Mallei).

Bacillus Tetani.

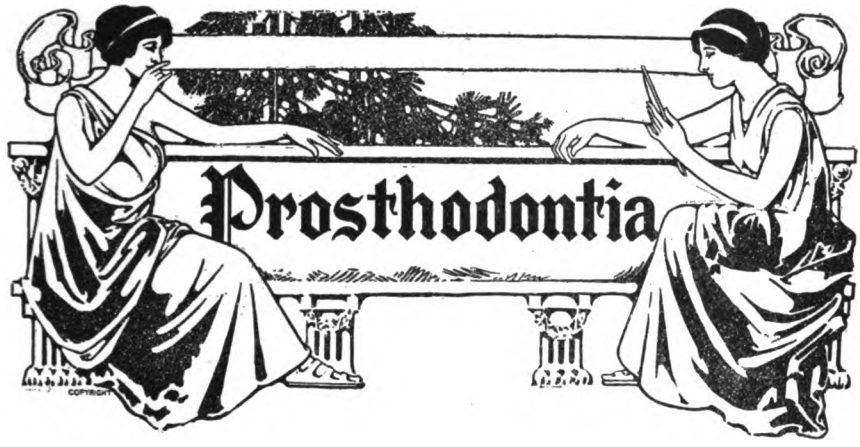
Tetanus in man may follow any wound which has been infected with the Tetanus Bacillus (Nicolaier, 1884). (Figs. 24-25-26). In the absence of a break in the integument, a so-called spontaneous form of tetanus may occur. This is due to the infection coming from the intestinal tract (Susse), or to the Bacillus Tetani having entered the tissues of the body by a wound long since healed. It has been shown (Vaillard and Rouget) that spores of this micro-organism when introduced into the tissues can remain dormant for a long time and later by germinating and producing the specific micro-organism, cause an apparent spontaneous tetanus. The spores of tetanus are widely scattered. When a guinea pig is inoculated with garden earth, mud from the street or slime, it generally dies of tetanus or acute experimental septicemia. This micro-organism is met with in the intestinal tract and feces of a large number of animals. All species of domestic animals may be attacked by this disease.

Pseudo-Tetanus Bacillus.

A non-pathogenic micro-organism resembling morphologically and culturally the Bacillus tetani has been found in earth and in meat infusions. Travel found in the intestines and, in great numbers, in appendicitis an anaërobic micro-organism so closely resembling the Bacillus of tetanus that he called it the Pseudo-Tetanus Bacillus, but which is not pathogenic for mice, guinea pigs or rabbits.

I am indebted to Dr. Francis O'vary for the drawings of the cuts.

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Success with Porcelain Jacket Crowns.

By Albert W. Strecker, A.B., A.M., D.D.S., Philadelphia, Pa.

The writer of this paper, while not treating of new or original matter, nor claiming any new methods, simply desires to call the attention of the profession to several cases occurring in his practice, which because of the various conditions surrounding them could not have been so satisfactorily improved by any method as by the porcelain jacket crown.

Case I. A lower right second molar. The tooth had a well-constructed and well-adapted gold crown, which had been placed in the mouth about three years prior to patient's coming to the writer for treatment. Owing to the gum swelling, bleeding and becoming very tender, the crown had been removed and gums treated. After a healthy condition had been obtained, the crown was again placed in position. After about two weeks, the old symptoms appeared, slightly at first, becoming more severe from week to week. This condition occurred three times. Patient at last consulted a physician and was referred to me with the following memorandum: "If condition cannot be cured, remove tooth." It was decided to replace the gold crown with porcelain. Three different makes of all porcelain crowns were tried, but owing to difficulty in securing a perfect adaptation had to be abandoned. As gums would not tolerate gold, a cast base could not be employed. Finally, the porcelain jacket crown was decided upon. The crown of the natural tooth was trimmed back about 1/32 of an inch below gingival margin, giving a raised base of about ⅛ by

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1/32 inch in width, being about 1/16 of an inch high. An impression was taken in plaster and cast in fusible metal; the impression of occluding teeth and bite obtained; case was mounted on an articulator, cast separated, model coated with a thin film of spermaceti, tooth built up of porcelain powder, cast slightly heated and tooth removed, placed in furnace and biscuited. Crown was again placed on model, built just a trifle larger than necessary, placed in furnace and baking finished. Tooth was now tried in place and found to be just right; cemented to place. After three years, gums have remained normal, and there has been no return of any pathological conditions.

Case II. Mrs. S———. A severe case of pyorrhea caused a general recession of gums; a copious discharge of pus was found; mouth was treated, a cure obtained, with the exception of gums around a gold crown. After several months spent on this tooth, without any marked improvement, it was decided to remove gold crown and replace it with a jacket crown. This was done, and after a few weeks gums responded very nicely. Two years from date of dismissal of patients, no further trouble has occurred.

Case III. Mrs. R———. A porcelain crown with cast base had been inserted on upper right first molar. When case came under my care, gums had receded and tooth was causing some annoyance. Removed crown and replaced with an all-porcelain jacket crown; gums were treated and brought to a normal condition. After three years, crown is in position and gums are in an excellent condition.

Case IV. Miss G———. Patient very nervous and suffering from anæmia, gastric trouble and subject to severe headaches; a constant presence of neuralgia. Found mouth in a very poor condition; pyorrhea was very much in evidence, especially marked in region of two molars, each having a gold crown. Crowns were removed and treatment for pyorrhea instituted. After some progress in overcoming pyorrhea had been made, porcelain jacket crown was placed over molar. A period of three years and six months has now passed, and mouth is still in an excellent condition, stomach trouble and anæmia have disappeared, and patient has no further neuralgia or headache.

Case V. Miss F———. A young lady about 20 years old. A gracious and otherwise more than pleasing appearance was spoiled by her bite being entirely too close, giving her a decidedly heavy lip, making her entire expression gross. Upon examining mouth, found in upper jaw we had seven teeth to work on, namely, two centrals, one lateral, one cuspid-shaped tooth on

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both sides, in region usually occupied by bicuspids, and two molars. The molars were badly pitted on occluding surface also to some extent decayed.

In the lower jaw found ten teeth, the four anterior teeth being merely small cones, extending beyond gingival margin of gums about 3/16 of an inch; the cuspids were in position and in good condition. Next, we had a bicuspid on either side, being a close resemblance to cuspids; on the left side the next tooth was a bicuspid of good shape, this being the last tooth on this side. On right side, a poorly developed and poorly shaped molar, the occluding surface being badly pitted and decayed; this was the last tooth. Only seventeen teeth had been erupted, none having been extracted.

Bridgework was inadvisable, as the teeth were not firm enough to withstand the strain of any additional stress; it would have necessitated the extraction of the four lower anterior teeth, and it was very questionable whether the gums would have tolerated the gold being forced under gingival margins. The first step was to open bite. This was accomplished by placing gold inlays in molars and bicuspid. By this method we secured an opening of almost half an inch, eliminating the heavy appearance of lips, changing the whole facial expression. The next step was to make jacket crowns for the three upper and four lower anterior teeth. Models were secured and, after giving them a very heavy coating of spermaceti, they were built around and up of porcelain body. Shells were then removed and biscuited, replaced on models built up to proper height and contour, then finished and cemented to place. Patient was dismissed for two weeks, to see if porcelain jacket had the proper strength for service. After this time, patient returned and a plate was made for upper jaw, carrying four teeth.

After three years, case has proven a success far beyond hopes, patient is delighted, and the teeth carrying jacket crowns have grown firmer. After a careful examination of case, can see no reason (as crown has now served over three years) why crowns will not remain satisfactory for an indefinite period.

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A Looped Arch and Appliance for Attachment.

By Ray D. Robinson, D.D.S., Los Angeles.

The appliance consists of a delicate spring arch (Fig. 1), bent to conform to the individual dental arch to which it is to be applied, with loops extending toward the root or toward the occlusal end, as may be found convenient, placed in advantageous positions; and an attachment consisting of a seat (Fig. 2) soldered to a plain band on the tooth, and a square hollow block of metal, the outside measurement of which is the same as the inside of the seat, and the bore of which is equal to the diameter of the arch wire (Fig. 3).

The seat has a flat base and parallel walls extending at right angles to the base, the walls being 50 per cent. higher than the width of the base which allows sufficient to bend over the fourth side of the block, thus inclosing it in a square tube which accurately fits it (Fig. 4).

In constructing and applying this apparatus, the bands with seats attached, as indicated in Figs. 1 and 2, are first made and cemented to the teeth, using the form of band on the anchor teeth shown in Fig. 5. The requisite number of blocks being loosely placed on the arch wire a long block, as shown in Fig. 5, is soldered to one end of the arch, which is then put into place and bent in such a way as to bring the arch into the adjacent seat, a loop being formed if desired.

One of the blocks is now brought to the proper place on the arch wire to engage in the seat. The arch is then taken from the mouth and the block soldered. The arch is again placed in the mouth and again

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bent to bring it into alignment with the next seat, it being understood that loops are formed between such seats as is deemed necessary for the development of force and for the directing of the movement of the teeth. This operation is continued until all the teeth requiring movement have been engaged, when another long block is soldered to the other end of the arch to engage the other anchor band.

After polishing, the arch is next put into place and the extensions of the walls of the seats are bent over the four sides of the blocks as shown in Fig. 4.

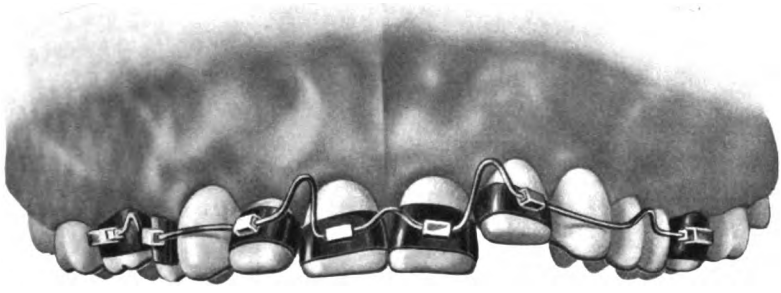


Fig. 1.

It will be readily seen that the attachment between the arch and the tooth is absolutely rigid, and any movement of the arch wire will in time be registered in the tooth.

In that form of appliance, having tubes soldered to the bands parallel to the long axes of the teeth, and posts soldered at right angles to the arch to engage in these tubes, such absolute accuracy of adjustment in soldering is necessary as to make the appliance efficient only in the hands of the most skillful. It must also be appreciated that as the planes of the posts and the arch are at right angles to each other, any inaccuracy in alignment will be magnified in the tooth movement. Given accurate fitting blocks, inaccuracy in constructing and adjusting this new appliance is practically impossible. The long axes of the arch wire and the block not only lie in the same plane, but the arch wire actually passes through the center of the block, eliminating all possibility of error in alignment.

As the block can both rotate and slide on the arch wire, it is easy to place it in the exact position required by forcing it into the seat. Once it is in its proper place it is pinched slightly with pliers to prevent its becoming misplaced while being carried to the flame for soldering. Thus it will be seen that it would require the grossest carelessness to make an error in alignment.

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There should be no trouble encountered in bending the arch wire into the desired form. The largest wire used is 24-gauge, B. & S., and very frequently 26-gauge wire will be found sufficiently heavy. As the first block is soldered before any bending is necessary, and as it holds one end of the wire rigidly in its proper position, and as the bending can be done in the mouth, the writer can see no reason for either error or difficulty in bending the arch, even by those of mediocre ability.

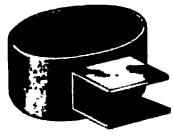


Fig. 2.



Fig. 3.



Fig. 4.

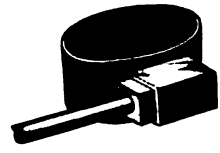


Fig. 5.

Tooth Movement.

A little study of this appliance will convince the most skeptical of its efficiency. It will be seen that by springing a loop open, force will be brought to bear on the teeth adjacent to that loop. As, for instance, opening the loops in the incisor region will exert force in the direction necessary to widen the arch as far as the cuspids. If it is found necessary to carry the incisors labially, the loops in the cuspid bicuspid and molar regions will be sprung open. If it be found necessary to carry the incisors on one side mesially, and those on the other side distally, without carrying them labially, as frequently happens, through the premature loss of the deciduous cuspid, it can be readily done by opening a loop placed over the cuspid region where the space is to be made and closing one over the opposite cuspid region. If it be found necessary to widen the arch in the bicuspid and molar region without widening the incisor and cuspid region it can be accomplished by slightly opening the seats on the incisors, allowing the blocks to slide distally through the seats, and then opening the loops in the incisor region. It will be readily seen that the force generated by opening these loops will be exerted in the desired direction and place.

If a movement tending to throw the apex of the root buccally or labially is desired, it can be secured either by bending the adjacent loops

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in the desired direction or by taking the arch from the mouth, heating the block, and while hot turning it in the desired direction. When again placed in the mouth it will be found necessary to spring this block to place. When the edges of the seat have again been bent over the block it will exert force that will cause the apex to move in the desired direction.

If it be found necessary to move the apex mesially or distally without disturbing the relative position of the crown it can be accomplished by

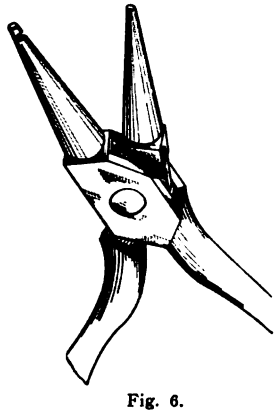


Fig. 6.

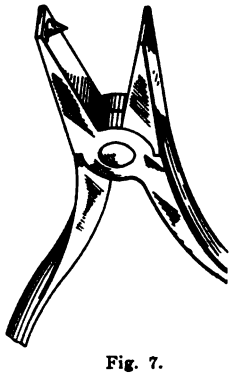


Fig. 7.

bending the adjacent loops in the directions indicated. It will be readily seen that more than one of these movements can be accomplished at the same time.

In fact, any desired movement of any tooth or teeth can be accomplished without disturbing other teeth which may be in their proper places. Two of the principal reasons for this are the facts that the attachment between the tooth and arch wire is absolutely rigid, and, second, the force necessary to the tooth movement is generated at the point where it is applied.

The force being that of a spring and generated from small delicate wire loops is not violent in its action, but slow and delicate, although none the less positive. Being of this character the result resembles a physiological rather than a pathological action, causes the irreducible minimum of pain and requires a shorter period of retention.

The force is more directly applied, is longer continued, is more easily controlled and causes less annoyance than that generated by any other appliance ever brought to the writer's notice.

It is obvious that a triangular block, or any angular or oval or round block, with a pin raised on one side, placed in appropriate shaped seats, would accomplish the same result. It is also obvious that the converse

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of this is true. That is, the same result could be accomplished by placing the seat on the arch wire and the block on the band.

The attachments could readily be used with the old form of arch, depending on the screw force, but the writer finds the force generated by opening the loops to be of such a character as to produce better results with less annoyance.

Two special pliers will be found convenient in handling this appliance. One shown in Fig. 5 has a sharp projection in one jaw, and is used to indent one side of the seat when it is desired to prevent the block from sliding in the seat.

The other, a pair of round-nosed pliers, Fig. 6, has a notch cut in one jaw near the end. This plier is used to spread the loops. The notch is placed over the convex side of the loop to prevent slipping, and the other jaw is then forced into the loop, thus spreading it.

Failure can follow an attempt to use this appliance only if the blocks and seats do not fit accurately. A piece of metal, bent to approximately the form of a hollow square with a block that fails to fit, will not obtain the desired results.

The inside angles between the base and the sides of the seats must be sharp and clear, not rounding, so that the block will rest firmly on the base, and the outside measurement of the block must be the same as the inside of the seat.

At first the writer had a great deal of trouble in securing proper fitting seats and blocks, but finally found it possible to get them made in a way that produces mechanically perfect parts.

After the appliance is once adjusted it is not necessary to see the patient oftener than once in two or three weeks, and it will often be found that where more than one loop is opened to accomplish the same result the force will continue for a month.

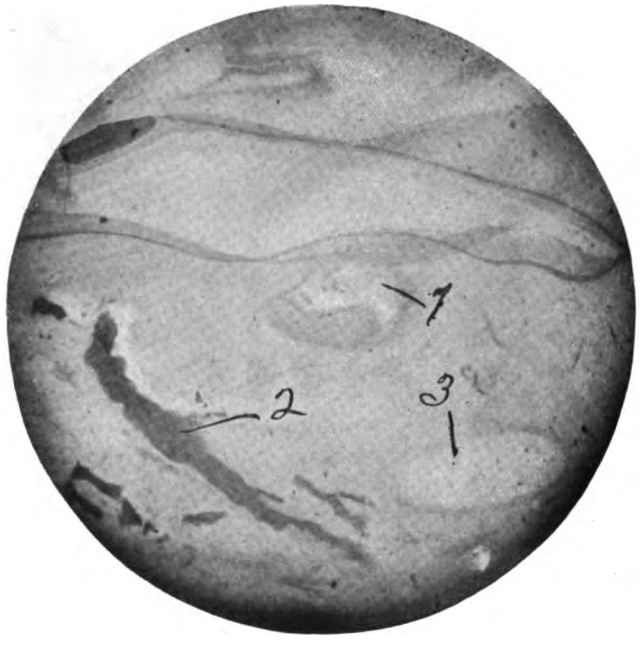
Bone Development as a Result of Mechanical Force. Report on Further Treatment in Attempting the Opening of the Intermaxillary Suture in Animals.

By Martin Dewey, D.D.S., Kansas City, Mo.
Read before the American Society of Orthodontists, Chicago, 1913.

The question of bone development as a result of mechanical force, and the opening of the intermaxillary suture, like some other questions, have been before this society a number of years. It will also be a number of more years before it will be satisfactorily settled to all.

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This slide (Figs. 1 and 2) shows the relation of the bone development to the tooth germ, and the intimate relation which exists between the tooth germ and calcification bears out the fact that bone develops wherever a tooth erupts. The theory has been advanced at various times



(Fig. 1. (1) Tooth Germ. (2) Bone. (3) Meckel's Cartilage.

of the possibility of moving the teeth so far that you move them beyond their osseous support. That is a condition which is not very liable to happen, and which I have been enabled to produce experimentally, because I have moved the teeth over the width of the alveolar ridge. I have moved a single tooth, and immediately after movement there was as much bone on the outside (labial side) of it as there was before it was moved.

This next slide shows the manner in which bone develops (Figs. 3 and 4). You see arranged the spicule of bone, and around it the osteoblasts, which are not far removed from the bone. These spicules of intermembraneous bone are thrown out into the connective tissue. The osteoblasts continue to develop bone, and the direction which the development takes depends upon the force exerted on the growing parts.

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In the development of the bones (Fig. 5) in the region of the sutures, the bone grows toward the suture, but does not unite by a boney union on the right and left sides. Sections of adults show connective tissue between the two halves of the bone. In moving the bones apart, the

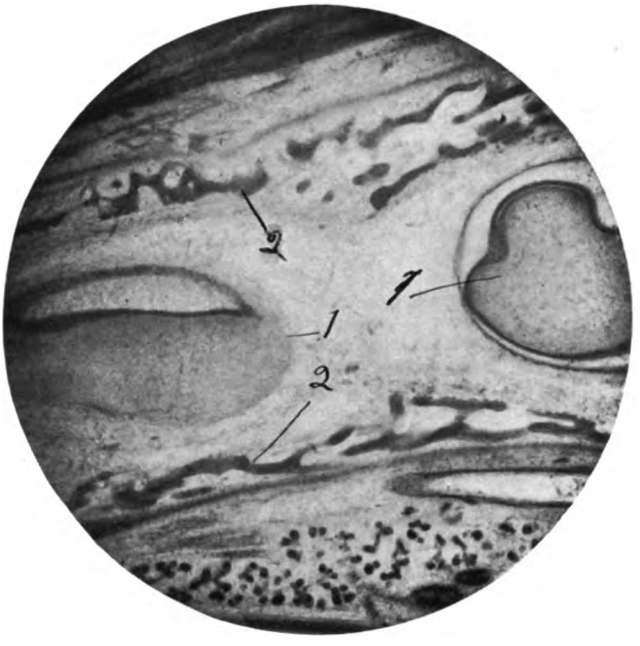


Fig. 2. (1) Tooth Germ. (2) Bone.

osteoblasts from the pre-existing bone fills in the space made by the movement.

The growth of the bone as related to the development of the teeth is shown, and the alveolar wall grows up along the side of the tooth, and you have one island of bone piled upon the other (Fig. 6). You have osteoblasts on the outside of the bone, which builds the bone as the tooth pushes forward (Fig. 7). Taking another section we see how the character of the bone has changed, and instead of compact bone we now have cancelleous bone with large medulary spaces in it (Fig. 8). Great areas of absorption occur, and as you go farther down, at the bottom, you get development of the muscle which is attached to this side, and this dense area as it builds out will be cut out by absorption and large spaces develop (Fig. 9).

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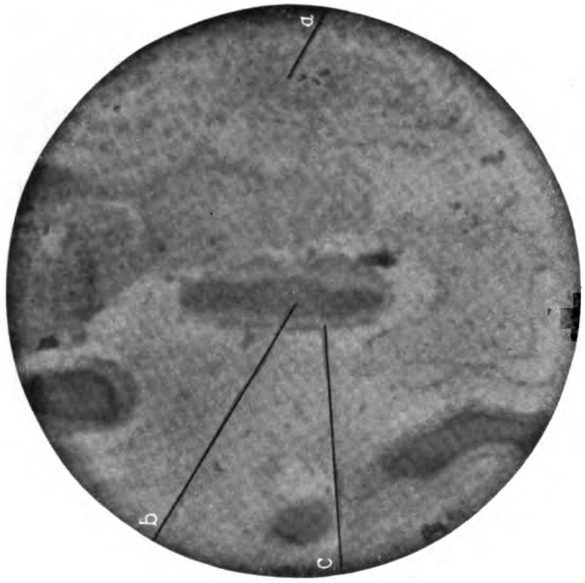


Fig. 4.

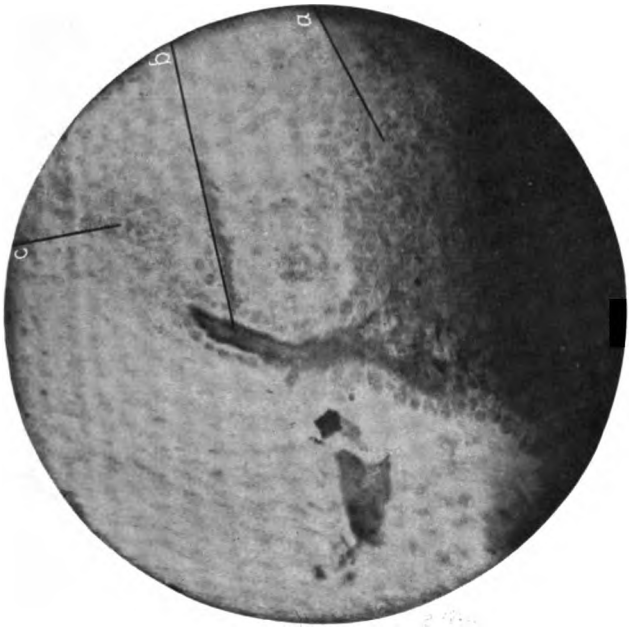


Fig. 3.

Fig. 3. "Intra-membranous bone formation."

Fig. 4. "Intra-membranous development of bone"

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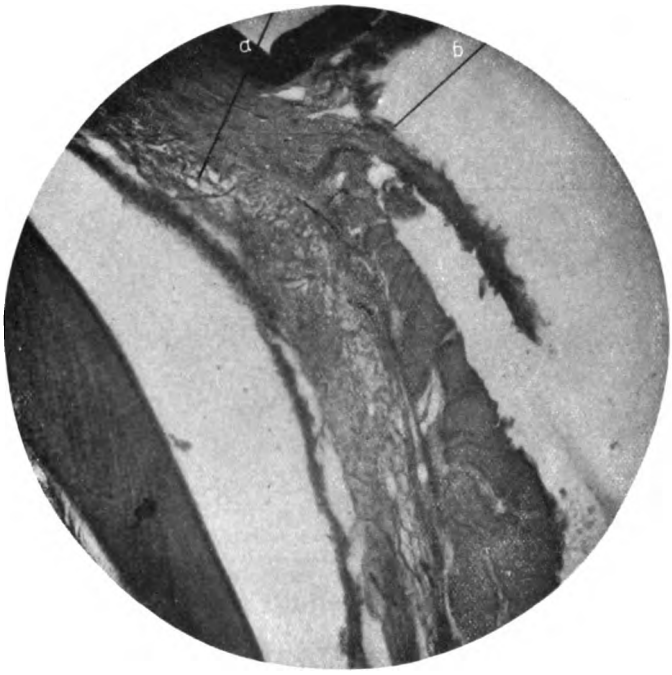


Fig. 6.



Fig. 5.

Fig. 5. Development of bone in region of suture.
Fig. 6. Development of alveolar process around tooth germ.

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Fig. 7.

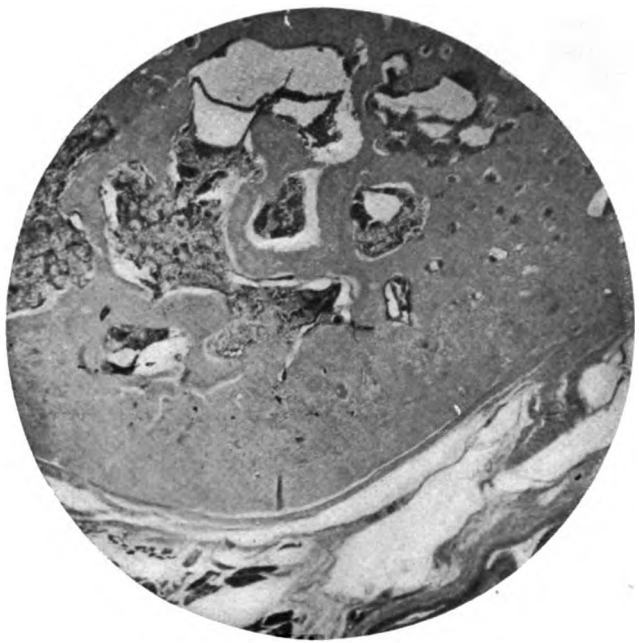


Fig. 8.

Fig. 7. Tooth germ with development of bone around it. (1) Tooth germ. (2) Bone of alveolar border. (3) Gum tissue.

Fig. 8. Cancelous bone below tooth germ.

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Experiments in Opening the Suture.

As to the experiments which were made in attempting to open the suture,* the criticism was raised last year, as to the dogs, and that some X-rays should have been made of the animals. It is not a difficult proposition to X-ray a dog.



Fig. 9. Thick bone for the region of the mylo-hyoid muscle.

Here is a radiograph (Fig. 10) made at the time the appliance was put on the dog, March 15th. The measurements across the tips of the canines are 15/20 of an inch. After the appliance was put on, another radiograph was made March 17th. This radiograph (Fig. 11) shows evidence of having opened the suture. It is interesting here to note that you have the right and left palatine foramina. You have the right and left half of the superior maxilla as it lies in the dog and the suture extending up to the premaxillæ. On March 23d, which is six days later than Fig. 11, you have an increased weight of 3/20 of an inch. You had this condition here (Fig. 12). (Illustrating.) Here is the rim here, alveolar process and edge of suture. Instead of the suture being open,

*See "The Development of the Maxillæ," with reference to opening suture. ITEMS OF INTEREST, March, 1913.

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you have a condition which in this picture shows black (Fig. 13). These are the original lines which represent the right and left halves of the maxilla. Notice how the anterior palatine foramina are situated, because the radiograph film was put to the right of the mouth. On April 10th (Fig. 14) you find you have practically the same condition, because I

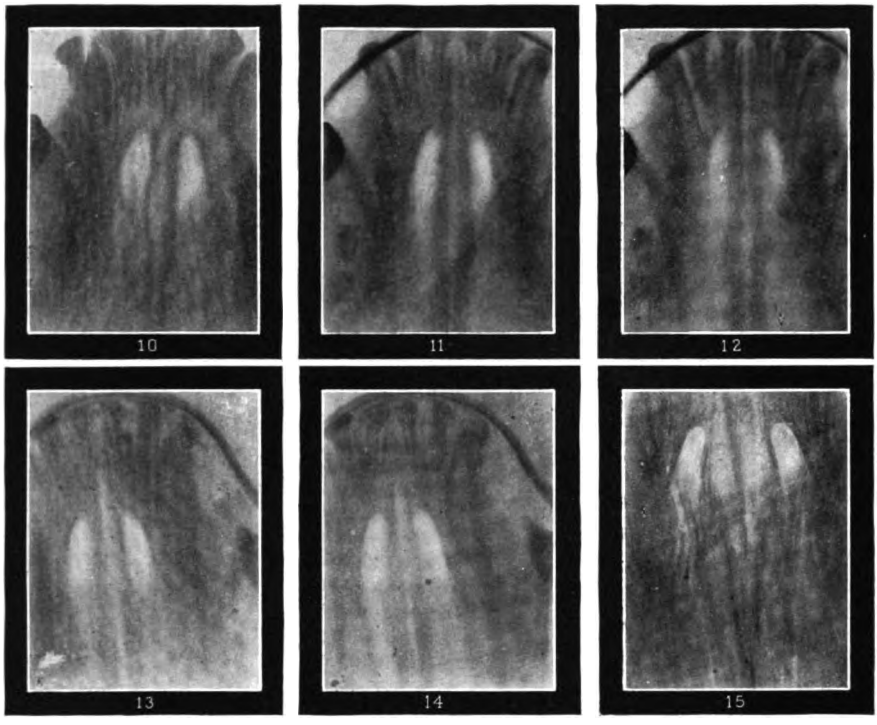


Fig 10. Made before appliances were put on. Made March 15, 1913.
Fig. 11. Made March 17, 1913.
Fig. 12. Shows a tooth movement of 3/20 inches over Fig. 10.
Fig. 15. Note how palatine foramina have separated and dark lines where suture was.

was out of the city at that time, and when I got back the whole bunch of dogs had their appliances off. But you have a loss of the little articular space which you had before, and it is filled up with something. You can still follow these (the palatine foramina) lines. The distance between the teeth is exactly the same as before. April 17th (Fig. 15) there is a different appearance. You have the anterior palatine foramina farther apart. The dark lines and the lighter areas are easily seen. You notice how the border of the suture curves; this begins to curve because the anterior palatine foramina are opposite the canines. Men say you

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cannot spring the bones. We are actually springing the bones, changing the roof of the mouth, and the arch of the mouth becomes lower and the whole thing presents a different appearance. You can see this is opened up in a V-shape exactly, but the opening is across between the



Fig. 16. Skull of dog killed after suture had been opened. (9) Posterior of opening. This dog was not X-rayed, but was used in the 1912 experiments.

two canines. This is opened away back in the region opposite the premolars, as is shown by the photograph of a skull after killing dog (Fig. 16).

Here is a radiograph, April 24th, in which the teeth have been moved (Fig. 17), when there had been an increase of 4/32 incres across the base of the teeth. The dark line which you see is the nasal septum, which

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has not been disturbed, and the lighter areas which you see on both sides are bone which has developed between the two halves of the maxillæ. (Indicating.) With the dark line disappearing, it shows the whole bone is actually being absorbed, so that you have almost the same density across the suture as before. The whole suture has not been rebuilt here, again, but simply turned down and built over.

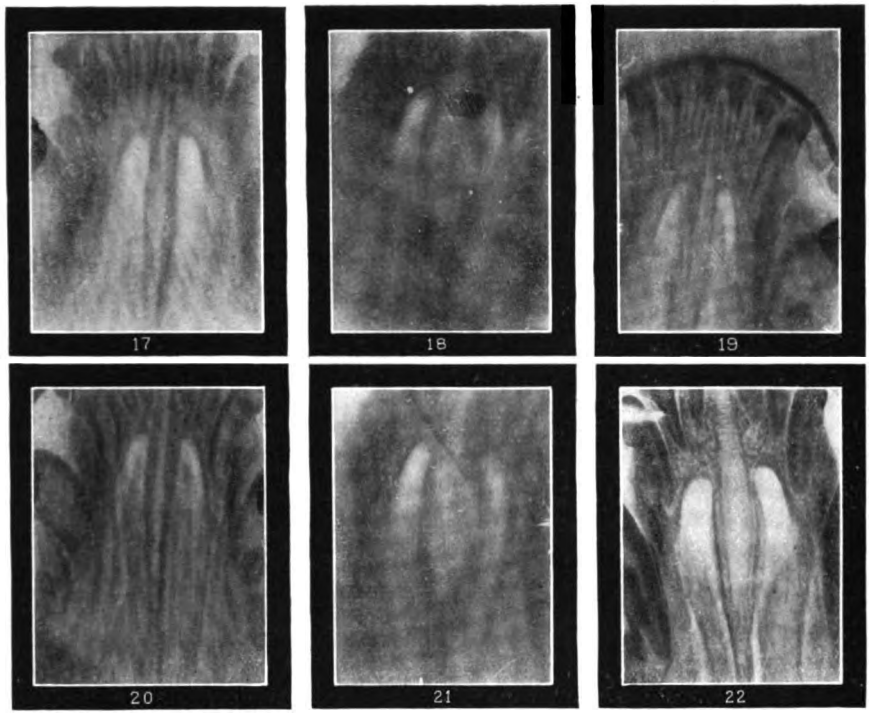


Fig. 18. Shows bone change through entire region.
Fig. 19. Showing parts before they have been moved.
Fig. 21. Showing springing of body of maxillæ in region of palatine foramina.

Here is a radiograph taken April 30th. At that time you had an increase. The tips of the canines were 22/32 of an inch (Fig. 18) and the base 24/32 of an inch. You will notice the anterior teeth are all together, but the roots have separated a great deal because stress has been transmitted from the canine. The anterior palatine foramen has become separated, new bone has been developed and the new bone does not stop the ray the same as the old bone. Why do the crowns of the teeth stay together with the roots separated so far? They stay together because the histological structure of the gum tissue of the carnivorous animal is

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very dense. It is full of inelastic connective tissue fibres. The fibres running up under the gingival margin of the gum being inelastic have held the crowns together so that they cannot spring apart. There is bone development around the canine seen here. (Indicating.) You have developed all through the region just as great an increase of bone around



Fig. 23.



Fig. 24.

Fig. 23. Skull of dog which did not have regulating appliances on. Dog of same breed as Fig. 23. Weight of this dog, 27 pounds. Notice shape of palate.

Fig. 24. Skull of dog which had appliance on teeth. Canine teeth were moved 26/36 of inch. Weight of dog, 27½ pounds.

the teeth, but the external plate of the tooth is developed just the same as the other.

Let me show you another radiograph taken March 21st (Fig.19), and you can see the opening of the dark area stops. You see, the roots of the teeth are decidedly different from those you had on the screen, because these have not been removed. Here is the anterior foramen together.

Here is one made April 10th. Note the difference between the one

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made April 21st and this. The width of the teeth when we began to work on them was 26/32 of an inch at the base. The anterior palatine foramen had separated (Fig. 20). The gap is wider. You see, the thing has begun to be loose. Bone has developed in there. There is a difference here between 33/32 of an inch and 26/32 of an inch. The dark line which you see is the perpendicular base of the nasal septum and the nostril. The whole suture is closed.

When you have attempted to open the suture, have expanded the arches, and then have cut in there to see whether the suture is open or not, you find it closed. But it has been opened; you have spread the connective tissue in the suture so that the osteoblasts can run through and fill the space.

This radiograph was made April 24th. There was a change from 20/32 of an inch to 22/32 of an inch.

Here is one made May 1st. It shows a difference of 4/32 of an inch.

As a result of the stress applied to the teeth, bone has developed, and developed in response to the force exerted by the appliance. The roof of the mouth has changed in shape and structure as the direction of the spicule has changed.

Here is one made June 3d (Fig. 21), and at that time you have an increase over the original measurement of 20/32 of an inch. In the first you see the anterior palatine foramina closed together. Now they are far apart. The canines are far apart, too, and the whole structure is new bone. The whole thing has been reabsorbed as the result of mechanical stimulation.

Here is a radiograph made of a skull which had had the suture opened. Instead of an open suture (Fig. 22) you have a closed suture. You get spreading of the bones, which unquestionably can take place resulting in mechanical stimulation of osteoblasts which closed the space. Cutting through dense tissue is no evidence that the suture has never been opened. The bone develops so rapidly that unless you have kept close track of your cases you might think the suture was never opened. Often I have seen men who were enthusiastic as to the opening of the suture claim that the two halves of the nasal septum were the edges of the suture. As I have shown in dogs, the bone will fill in the suture so that the edge of the old suture disappears.

Is there any Advantage in Opening the Suture?

The question arises, what is the practical significance of this? Does it do any good to open the interpremaxillary and the intermaxillary sutures? Admitting it can be done on dogs, the question arises, do you gain any advantages by doing that over moving the teeth gradually? I am of the belief you do not, because

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observation of these dogs and of the skulls shows that bone has developed all around the teeth, and you have this development as a result of mechanical stimulation. You can put appliances on the teeth in a youngster and widen the arches, and the spicules of the bone which grow in between the suture are the result of mechanical stimulation. The development of the whole alveolar process is the result of mechanical stimulation, and with each individual tooth as it erupts the alveolar process follows it. By moving the teeth you will get the development of the bone all around, and that development of the bone occurs more readily in a young child, but it will occur also in an adult if properly treated. As you spread the arches apart you will get development of bone in between the two halves, but the development of bone as advocated is not going to maintain the expansion of the dental arch. Bone develops all around the teeth, as was shown by the development of bone around the first molar when the appliance was placed on the canines.

The development of bone as the result of an attempt to open the suture has been proven, and the influence which bone has on the retention of teeth is another problem.

Discussion on the Paper of Dr. Dewey.

Dr. O. W. White, Detroit, Michigan.

I do not feel capable of opening the discussion on Dr. Dewey's paper, for the reason that I had no means of knowing what he was to talk about; neither did I see the slides, which are very beautiful. I think, though, if we knew the histological structure of the bone tissue, which Dr. Dewey shows developed during spreading of the suture, we would find it very different in cellular formation from the surrounding bone tissue. Dr. Oppenheim, of Berlin, has carried on quite extensive research work on monkeys, and he shows in tooth movement a very marked difference in the bone formation, little spicula of the bone developing at right angles to the tooth, instead of circular or horizontal. Of course, he did not move the teeth as slowly as Dr. Dewey. He consumed forty days in moving teeth, which was a rapid movement. Dr. Oppenheim found when he removed the pressure, the new tissue was resorbed rapidly, tissues returning to normal. So I think, probably, the tissue developed in these sutures of dogs and monkeys, are very similar. Dr. Dewey should give us the histological structure of this bone and if he did so we would probably see a great difference in the formation. In working on normal arches and tissues in the experimental animals, the conditions are not similar to abnormal and the results are of very little clinical value under such circumstances.

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Dr. R. Ottolengui, New York City.

I was very sorry when I saw my name on the program to discuss this paper, and more so now. But I want to say, that it does not seem to me that the evidence presented is entirely convincing that those sutures have been moved apart, and for the reason that, in the first place, as I recall the illustrations, those that were most apparent were those in which the sutures were open, so one could hardly say he opened the sutures when they were already open. In the second place, the deductions depend upon the view in which he pictures the arch, which, rightfully represented, shows the borders of the suture are farther apart, and in between them lies new bone. But, it seems to me, the pictures which Dr. Hawley showed two years ago are almost a facsimile of this and his deduction was quite a different one, and quite a logical one, that the bone did not move apart, but that the bone had been stretched. Against that theory is the fact that those dark lines appear to be the borders of the bone themselves. If Dr. Dewey, in addition to these radiographs, both before and after death, can show from microscopic and macroscopic examination that the darker shadows were reflected from dense bone, *and not from tissues that lie above*, I would much more readily accept his deduction.

Dr. C. A. Hawley, Washington, D. C.

I do not know that I can add anything to Dr. Dewey's presentation, but I can say that in the last year I have not made any X-rays, nor have I gone any further in an attempt to find absolutely what occurs when the suture is opened; but I have found some cases in my practice where I thought it would be a great advantage to do that operation. I think what Dr. Ottolengui just said is true. When I came to think over those cases (there was something like fifteen to twenty of them), I do not know, that in the majority of them I really gained anything more than I would have done if I moved the teeth slowly. But in some I did. Let me mention one of the first cases. You remember the child, seven years of age, in whose case there was a lingual occlusion of the molars on one side. The case was treated in three weeks. The retention has been good and the teeth have developed normally since that time, and I relieved this child from the nasal stenosis quickly. Within two weeks, the contour of the face was changed, the child was very much better, and the result is permanent and more satisfactory than if I had resorted to slow treatment. The child will have to be treated again when it is older, as there will be a certain amount of malposition of the individual teeth. Then there is a case I treated, a young man eighteen years of age. I have shown X-rays of this case and the apparent opening of the suture, but I cannot say that I really

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gained anything. I have had to treat that case just as long. I relieved the nasal stenosis a little more quickly I think.

Where this treatment is advisable and would be satisfactory is in the case of a child, seven or eight years of age, where there is lingual occlusion of the upper teeth and you do not wish to disturb the lower. In such a case I would produce a rapid movement and obtain a result in two or three weeks. I cannot see any harm that can possibly obtain from this, and it will save a great deal of time. As most favorable I would select lingual occlusion of the upper molars and bicuspids. If you treat a case by moving the lowers, I do not see you gain anything at all from a practical standpoint.

I recall another case I treated this year in which I used this method. This was not a case where there was a lingual occlusion of the upper teeth, but there was great overlapping of the central incisors. I opened the suture in three weeks, moved the incisors into place and held them there, and that held the expansion in the molar region; then I slowly expanded the lower. That treatment was very satisfactory. It was much easier than the regular treatment. Then I have treated one child, about seven years of age, this year with a satisfactory result. I got through with it in three weeks. It was a success. The nervous condition was relieved quickly. In carefully selected cases of that type it is a valuable method. In these cases I have not put a jackscrew into the mouth when I could get along without it.

I saw some X-rays three weeks ago that were made in the case of a child with abnormal development, where a jackscrew had been used across the mouth, then an X-ray taken. It showed absolute separation of the suture.

Dr. R. Ottolengui. The men who have advocated this movement have claimed for it advantages that are to be gained in many respects. They have not claimed there can be any advantage to a child in lessening the time of the movement of the teeth.

I consider these experiments of Dr. Dewey of vital interest; at the same time, I want to call attention to the fact that the muzzle of the dog is different from the muzzle of the child. There is considerably more of the dog's muzzle anterior to the attachment of the malar bone than in a child, and a point of great importance is the resistance of this bone. It seems to me a very different thing to spread the anterior portion of the dog's long muzzle or to spread the posterior portion of the palate or any portion of the suture in a child. It has also seemed to me that unless the movement is distal to a line drawn across the bicuspid region, we can hardly expect a great increase in the nasal space.

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Another point: In one or two of his pictures Dr. Dewey showed us not only the lines which were originally the sutures spread apart, but an outline through the center which was the shadow cast by the vomer. In some of the pictures where there was as much separation, there was no shadow cast by that bone. What became of the vomer? What is the exact nature of this suture? It is not simply the union of two bones, but immediately above is an attachment of the vomer itself. Suppose the palate bones are stretched apart, it does not seem to me that it necessarily follows that you can get additional space in the nasal cavity, unless you can move apart the lateral walls of the nasal cavity itself. When Dr. Hawley speaks of opening the suture I presume he means only the anterior part of the suture.

Dr. M. N. Federspiel, Milwaukee. I would like to ask Dr. Hawley a question. He remarked that he had a case where we widened the upper arch and improved the nasal stenosis. Did you make an examination of the nose.

Dr. Hawley. No.

Dr. Federspiel. I fear I cannot accept what has been said for the reason that I believe when we widen the upper arch we increase the space for the tongue to come forward, but you do not cure any of the pathologic conditions. Of course, there may not have been any.

Dr. Hawley. I have no evidence in the way of measurements or examination. I wish to say, however, the boy was never able to lie down and breathe through his nose previously, yet at the end of three weeks he was able to do so. It relieved the abnormal condition, whatever it was.

Dr. Federspiel. Patients frequently act nervously when they take ether. This is usually due to the fact that the mandible slips back and the tongue drops; when the assistant draws the tongue forward it permits the patient to breathe more freely.

In regard to opening the intermaxillary suture, time and again I have reported having injected novocain after the arch had been expanded, made an incision, retracted the periosteum in order to find out whether the suture was opened or not. I am satisfied you cannot open the palatine suture, but mechanical stimulation of the maxillary bones will permit of greater stimulation of the osteoblasts to reform bone, and thereby increase the space for the tongue to occupy a normal position.

Dr. Dewey. In regard to Dr. Federspiel's injecting novocain and dissecting down to see whether the suture is open or not, he has only proven it is closed. It does

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not prove that it has not been opened, and in the dog, in a week's time you have an entirely different condition from what you had in the previous week, as is shown by the X-ray. If you exert pressure on the two halves of the maxillæ a bending of the bone occurs within three or four days and an opening of the suture that will fill up with new tissue. That brings up the proposition as to whether it is bone.

Dr. White says that Oppenheim in his research work found spicules of bone running in different directions. That is brought about by mechanical stimulation, and if regulating appliances and the forces of occlusion are brought to bear in different directions the result will be that the bone will develop in different directions.

In regard to what Dr. Ottolengui says about the maxillæ of a dog being different from that of the human being, that is true, but in the dog experiments you do not get an opening in the anterior palatal region, but directly across from the canines. It does not open in front of, but between, the canines.

I put bands on the canines with a long perpendicular tube on the buccal side; then I take the expansion arch, draw the temper so that I can bend the ends at a right angle and slip right angle end into the tube.

Dr. Ottolengui. The greatest stress is across the cuspid region?

Dr. Dewey. Yes. I open there first. You can use a jack-screw and open the suture, but in the course of a week or so it will be closed up, and you do not gain very much by doing it. In the meantime, if you take off the regulating appliance that bone will be resorbed again.

Going back to the proposition of what constitutes bone, I will say that bone is simply calcified connective tissue arranged around nutrient canals. The bone you get in between the suture is compact bone, or sub-periosteal bone and is a transitory structure. It does not exist very long because it is too thick; not enough nutrition enters the canals and it is changed to the Haversian system or cancellous bone.

Dr. Young. You made the statement that when you separated these bones the new bone changed in a short time, in a week or ten days, and if pressure was removed the bone would be resorbed again.

Dr. Dewey. Yes, sir.

Dr. Young. How long, in your judgment, is it necessary to keep the two lateral halves apart to make sure that the bone would not reabsorb in the cases that come back?

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Dr. Dewey. You would have to keep pressure on the halves during the lifetime of the animal. By that I mean this bone developed as the result of mechanical force and you must keep some kind of mechanical force there to maintain it. If you put on an appliance you make that bone develop as a result of the mechanical appliance, and unless the forces of occlusion are the same as the forces of the mechanical appliance the bone will be resorbed because you have taken away one force and another has not been brought to bear on it. You can hold the teeth until you break that appliance off, but if the force of occlusion is not the same as the regulating appliance, the teeth will move as the result of the mechanical force. Bone is a constantly changing tissue. The skeleton of to-day is not the skeleton we will have next year at this time. There is no such thing as permanency in bone. Take a section of bone anywhere from the animal skeleton and you will find evidence of resorption and rebuilding as the result of mechanical stimulation brought to bear on it. The lacuna or bone cell does not belong to any "labor union." In such instances, unless he is rescued by osteoclasts he is a dead cell, and undergoes necrosis. The bone in the dried specimen is the inorganic portion of it; the organic portion is the lacuna, so that as a result of that I am prepared to make the statement that the final solution in retention is the final solution in the adjustment of the forces of occlusion to hold the teeth in that position, and keep the bone developing all the time.

Dr. Federspiel. Would you attribute that to forms of malocclusion? Would it depend upon malocclusion?

Dr. Dewey. Retention in all cases of malocclusion depends uopn the forces of occlusion.

Dr. Federspiel. Regardless of what the etiological factor may be?

Dr. Dewey. Yes; all etiological factors of malocclusion act, because they destroy some one or more of the forces of occlusion.

Dr. W. E. Grisamore. In the bodily movement of teeth do you move the tooth beyond the alveolar process?

Dr. Dewey. I never have. I have moved the canine teeth in dogs so that in opening the suture I have moved the alveolus, although necrosis has not been the result because the canine is moving with the alveolus.

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Dr. Grisamore. Did you ever move the cuspid so that the apex of the root came through?

Dr. Dewey. No. I do not believe you can do it unless you have a pathologic condition around the teeth.

Dr. Ottolengui. I have seen a case where the anterior roots had been moved by an appliance until four of the roots were sufficiently prominent to put the finger on the apices and feel them and they were covered with bone and soft tissue.

Dr. Case. When the force of an appliance is stopped, the tooth stops moving, does it not?

Dr. Dewey. The teeth may move as a result of natural force.

Dr. Case. You said the forces started the cells working the minute they stopped moving.

Dr. Dewey. Cell activity produced by the mechanical appliance stopped and the natural forces of occlusion then produces a cell activity.

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The Dental Aspect of Oral Infection.

By M. L. Rhein, M.D., D.D.S., New York, N. Y.
Lecturer on Dental Pathology, Department of Dentistry, University of Pennsylvania.
Read before the New York Academy of Medicine, February 5, 1914.

The study of the anatomy, physiology and pathology of every part of the human body, with the exception of the dental organs, is a part of the medical curriculum. These organs consist of the teeth, their lining membrane the pericementum, the alveolar structure and the gums. They guard the vestibule of the digestive tract and their normal use is an important phase of the first scene in food digestion and assimilation. They are at different times surrounded by many pathogenic micro-organisms, and any deviation from a physiologic status must surely tend to interfere with normal digestion and food assimilation. Notwithstanding the important rôle which these organs play in health conservation, the young physician starts into practice without having received any proper instruction concerning them either in health or in disease. Consequently, without proper post-graduate study it is impossible for him to appreciate the difference between good and bad dental therapy.

I bring to the Fellows of the New York Academy of Medicine a plea for recognition of a specialty whose highest aim is to preserve the health and integrity of the portal of the digestive tract.

Bacteriology during its relentless conquest of empirical medicine has shown the mouth to be the most prominent propagating point for almost every kind of micro-organism. The knowledge already obtained of the

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etiologic relation of the dental organs to infectious diseases must surely bring the entire medical profession to a realization of the fact that their duty to the public health demands that they should obtain such knowledge, that they will at least be able to judge as correctly the merits of the dental services rendered to their patients as of services rendered through any other specialty.

The dental organs, like the hair and nails, can be classed as end organs, and consequently are very impressionable to any nutritional impairment. The alveolar portion of the jaws consists of a buccal and lingual plate of bone between which are masses of bone divided into crypt-like cells filled in with a mixture of fibrous embryonal and degenerative remnants of epithelial structure. The roots of the teeth are imbedded in this structure and united to it by tendons and a membrane known as the pericementum, or the peridental membrane, which in turn unites with the periosteum. Blood vessels and nerve fibers pass through foramina at the ends of the roots and lead through the root canals to the pulp chamber which is filled with a jellylike mass of embryonal tissue. The gums are especially marked by their great vascularity. This tissue is ramified by a vast network of anastomosing capillaries and is a covering to the alveolar structure.

Sepsis About the Teeth.

Septic conditions of the dental organs can be divided into three classes. First, where there is a free purulent discharge into the mouth. This may come from a sinus which has burrowed through the alveolar plate and through which is discharging an alveolar abscess eminating from a putrescent pulp. Or there may be a discharge of pus from pockets alongside of the roots of the teeth without having any connection with the pulp of the tooth. This condition is generally known as pyorrhea alveolaris. The etiology of this latter lesion is very varied. In all forms of malnutrition this pathologic state may become a very marked symptom, depending largely on how much the resistance of the individual has become impaired.

Realizing that we are dealing with end tissue it is not surprising that the first symptoms of any form of malnutrition should be manifested around the gums with its vast network of anastomosing capillaries. "It is not unreasonable to suppose that the chemical change that takes place in the blood under such circumstances varies according to the organ involved and the nature of the malady. This accounts for the great difference in the clinical picture of the gums in different forms of pyorrhea alveolaris."* A minute study of the different pictures to be

*Rhein, M.L., New York, DENTAL COSMOS, November, 1912.

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seen in the mouth in different types of disease will not only be found an invaluable aid in differential diagnosis but frequently can be utilized as the means of making a positive diagnosis of some grave disease long before any other symptom manifests.

There is another type of pyorrhea much more frequently met which is due to trauma and localized irritation. The destruction of the first line of defense in such cases is mostly produced by improper dental

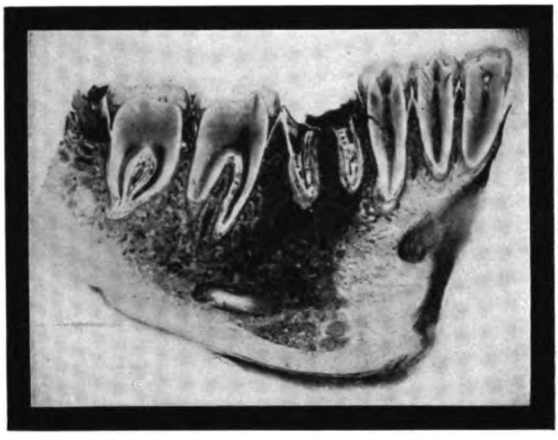


Fig. 1.

operations. Another cause is found in the impeded eruption of third molars.

Purulent exudations in the mouth also come from impaired tonsils and from the pharynx. Exfoliating pieces of necrotic bone or roots are also frequent etiologic agents.

Systemic Infection from Oral Sepsis.

The effect upon the rest of the body of the constant swallowing of purulent matter has been the subject of much discussion. Science has to-day practically eliminated the idea that the gastric juice is a barrier to the passage of bacteria and pus from the stomach into the intestines. "Undoubtedly most of the swallowed bacteria are destroyed, not by any of the digestive secretions, but by competition with the normal intestinal bacterial flora which has pre-empted the ground when the nutriment is after all limited in quantity. When, however, instead of merely swallowing the ordinary bacteria mixed with the food, the individual is constantly swallowing certain amounts of pus, an entirely different problem presents. The nature, virility, and number of the micro-organisms must have a strong influence

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Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.

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as to their ability to overcome the surface immunity of the digestive tract. Many forms of diseases of the stomach and intestines are possible. By means of their development in the digestive tract such bacteria are very easily absorbed in the circulation and pass into the lymph spaces. After this fortress of the body has succumbed, the bacteria with their poisonous products appear to be irresistibly drawn to the most vulnerable of the vital organs. Medical literature is replete with cita-

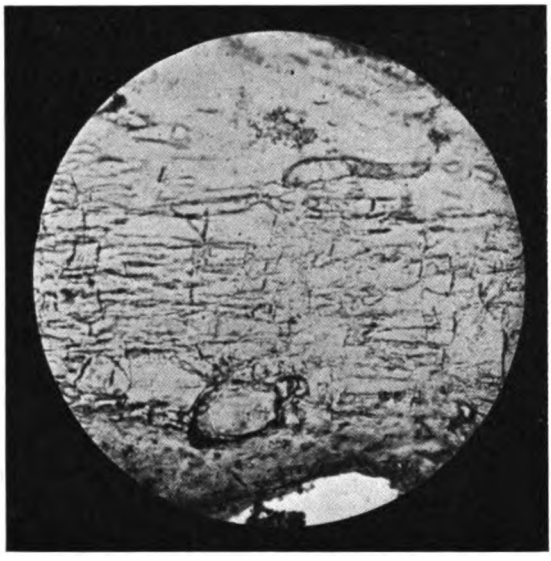


Fig. 8.

tions of numerous forms of disease due to pyogenic bacteria which are traced to this one source."*

Pericemental Abscess.

The second class, pericemental abscesses, are those cases where pericemental tissue becomes infected from some form of pyogenic bacteria. In these the vitality of the pulps of the teeth remains intact. While they are supposed to be rarely met, it is more probable that the attending dentist has failed to make a correct diagnosis of the diseased area. This infection is much more common than is appreciated at the present time. The most rational theory of its etiology is that enamel germs of the teeth have left sufficient epithelial cells in this membrane to become an attractive nutriment for pyogenic bacteria. After some time infiltration causes the establishment of a sinus, reaching

*Rhein, M.L., New York, DENTAL COSMOS, November, 1912.

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generally to the neck of the tooth, and in this state is only too frequently diagnosed as an ordinary pyorrheal pocket. The treatment of pericemental abscesses is very poorly understood at present. Its differential significance must, however, not be overlooked.

Blind Abscess.

I have reserved for the third class the most important type of mouth infection, the non-fistulous granuloma or blind abscess attached to the end of a root and which grows in size at the expense of the osseous structure of

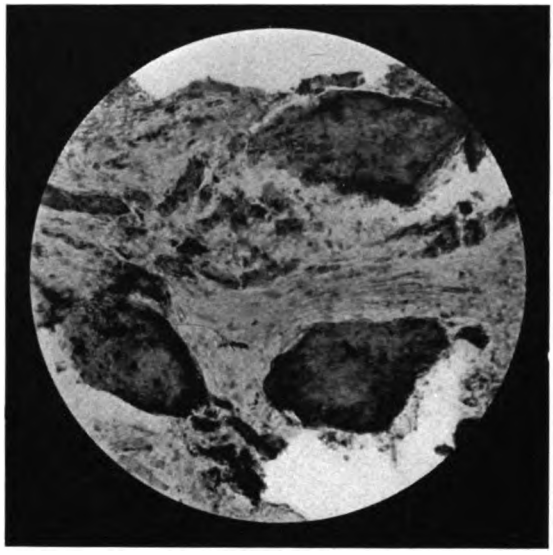


Fig. 9.

the alveolus. The importance of these cases rests on the fact that there is no mouth outlet for the purulent matter, which is, therefore, confined to a small area in the alveolus. Nature attempts to limit the size of a granuloma by means of a thick fibrous envelope, which defends the adjacent tissue as much as possible from infiltration. Notwithstanding this defense, a gradual absorption of the bacteria or their toxins is going on continuously. "The pathogenic bacteria escape from the local foci of infection by penetrating into the surrounding pervious lymph spaces and capillary vessels, into which they push, through continuous growth, or are carried by their own motility or by motile phagocytes."* The crypt-like cells of the alveolus make the infiltration of these products very easy when once they have passed through the envelope of the granuloma.

*Rhein, M.L., New York, DENTAL COSMOS, November, 1912.

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Fig. 10.



Fig. 11.



Fig. 12.

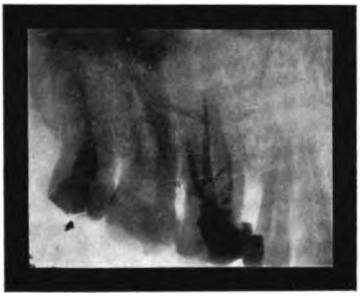


Fig. 13.

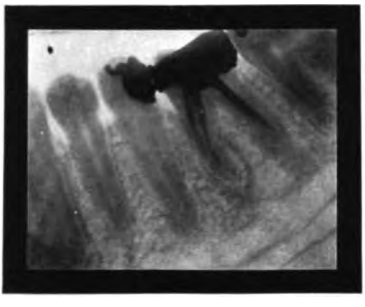


Fig. 14.



Fig. 15.

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Dangers from Blind Abscesses.

The small amount of inflammation and the quiescence of these abscesses is most likely due to the low type of virility of the bacteria present. Patients may have a number of such abscesses without experiencing the slightest symptom of discomfort in the infected region. It is to be regretted that there is not sufficient time to detail clinical records of these cases, but it is worthy of note that on bacteriologic examination the majority of cases show the presence of streptococcus viridans. That the attack of this low type of organim is especially directed against the heart is well understood. If these observations are correct, the insidious nature of these abscesses and the grave danger of producing one of the types of endocarditis cannot be minimized. Blind abscesses have been known to remain quiescent for many years and then suddenly develop so great an activity as to readily change into the ordinary type of alveolar abscess with a sinus opening into the mouth.

Rosenow's recent demonstration of the possibility of changing under certain conditions, one type of streptococcus for that of another, would readily account for a blind abscess suddenly changing from a quiescent character into one of great activity.

These abscesses must be differentiated from the dental cyst found in this region and which are found devoid of the presence of any pyogenic organism.

The X-rays have disclosed the fact that these infections are exceedingly common. The infection of any portion of dead pulp tissue is the immediate exciting cause. It may occur in the tooth where caries is followed eventually by death of the pulp. Inflammatory action and subsequent death of the pulp under the most skilful of dental operations is always a possibility. A traumatic condition producing a rupture or strangulation of the pulp where it enters the root canal is not infrequent. The most prolific source of blind abscess comes from imperfect dental operations involving the pulp of the tooth. Under the guise of dental aid the patient is innoculated with the toxin which left untreated must result in the gradual destruction of the heart function.

That the physician is ignorant of the large number of severe diseases arising from bad dentistry is well illustrated by the fact that so many cases of this kind are found in the mouths of physicians themselves. With our present knowledge there is no excuse for this condition, and when once understood by the mass of physicians, neglect that can be followed by such grave results, will no longer be tolerated. Scientific treatment of pulps and root canals should leave a result in which septic infection is imposible. In the small percentage of cases where this end

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Fig. 16.



Fig. 17.



Fig. 18.



Fig. 19.

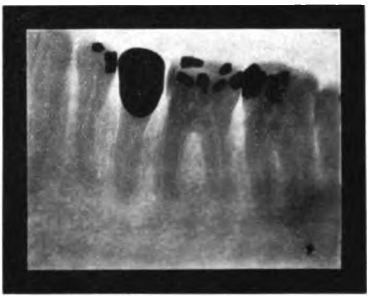


Fig. 20.

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cannot be attained the tooth should be extracted. The technique of such work requires a very delicate procedure and necessarily great skill, and frequently the expenditure of hours of labor.

Pulp and Canal Treatment.

The pulp, for operative purposes, can be compared with the marrow of the long bone and all stages of its treatment should be carried on under the most careful aseptic surroundings. Every particle of pulp tissue must be extirpated and the canals opened to the very

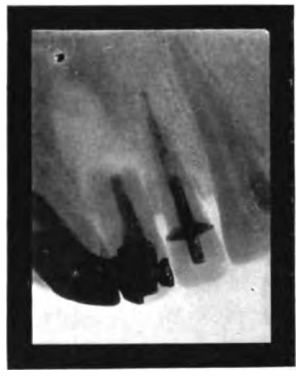


Fig. 21.



Fig. 22.

ends of the roots. Only since the X-rays have been at our disposal has it been possible for the dentist to know whether operative measures of this nature have been successfully completed. Consequently therapy in this field should invariably be accompanied by radiographic proofs. The removal of pulp tissue on account of the curved nature of so many roots, together with calcarious degeneration in so many cases, makes the operation one that frequently requires numerous hours of the most careful manipulation. Only when a fine wire can be introduced to the very ends of each root canal can there be a certainty that the root is ready for the next step in the operation, which consists in sealing the lower portion of the canal with a filling which homogeniously seals every nook and crevice in the canal and, if possible, encapsulates the end of the root. The filling material should have no properties which can possibly irritate the tissues in the apical region. The ends should, however, not be sealed while any infected area of the alveolus is present. All such pathogenic tissue must be removed. This can be done either by a surgical curettage or by electrolytic therapy.

As long as the root itself has not become necrotic, the application of zinc electrolysis will clean out the infected zone. The radiograph

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has shown so many cases of restored alveolus after this treatment that its efficacy as a radical cure for such necrotic areas appears to be thoroughly proven.

After the end of the root has been hermetically sealed and the canal filled, the pulpal end is covered with an antiseptic cement, of which oxychloride of zinc cement is a good example.

The faulty root canal work, done by the most skilful operator, without the aid of the radiograph has made this aid an absolute necessity from the commencement to the completion of these operations. By means of this view of the alveolus, roots whose curves make the reaching of their ends appear almost impossible, can be entered at such a point as to practically eradicate this curvature.

If the final picture should show an imperfect operation, it is imperative that the root filling be removed and replaced by one without defect.

A few lantern slides will perhaps better illustrate the value of the radiograph and some of the technique described.

Fig. 1. This is the photograph of a very thin ground section of one-half of the mandible in which blind abscesses are seen attached to the ends of the roots of the first molar. The one attached to the distal root is the larger of the two. The infiltration of the septic substance through the crypt-like cells is well shown.

Fig. 2. This is a radiograph illustration of a blind abscess over an upper lateral incisor.

Fig. 3. This is a picture of the same tooth seven months later and shows the growth in size of the granuloma during this period.

Fig. 4. This shows an abscess of an upper lateral and an upper central incisor caused by imperfect root fillings which permitted seepage through the end of the root. The pus has burrowed its way to the neck of the central, where it empties into the mouth. A probe is seen passing through the sinus to the abscess.

Fig. 5. This shows two abscessed upper incisors.

Fig. 6. This is the second radiograph of these teeth after the pulp tissue has been removed. Gold wires have been placed in the root canals and they give evidence by penetrating through the end of the canals that they have been cleaned to their very ends.

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Fig. 7. This has been taken after the zinc electrolysis has been applied to the alveolar structure around the ends of the roots and the root canals hermetically sealed, showing encapsulation of the ends of the roots.

Fig. 8 and 9. These show micro-photographs of sections of pulp tissue in which calcareous deposits have strangulated the circulation in the pulp. Normal pulp tissue is almost obliterated by this hardened calcareous abnormal structure. Especially in multi-rooted teeth this is the greatest obstacle to cleaning out the canals to their very ends. The persistent application of sodium and potassium will accomplish the desired result.

Fig. 10. This shows an upper molar, where, on account of such calcific matter, the dentist failed to penetrate beyond the entrance to the three canals. Infected areas are noticeable at the ends of the roots.

Fig. 11. This shows the same root after the old filling has been removed and by means of instrumentation and the use of sodium and potassium the lingual root has been entirely explored, the disto-buccal almost entirely, but the mesio-buccal only a short distance. The picture demonstrates, that, on account of the curvature of the mesial root, it is necessary for the operator to remove sufficient tooth structure to permit the wire shown here to enter the canal as nearly as possible at the mesio-buccal angle and so, for operative purposes, obliterate the curvature of this root, converting it into a comparatively straight root canal.

Fig. 12. This shows the gold wires in all the canals after the next operation and after the entrance to the mesial canal has been brought much nearer to the approximal side of the tooth.

Fig. 13. This shows the tooth at the completion of the root fillings.

Fig. 14. This shows good root fillings completed in a lower molar.

Fig. 15. This shows good root fillings completed in an upper molar.

Fig. 16. This shows a series of alveolar abscesses of lower front teeth with their sinuses opening at the necks of the teeth.

This case was, for years, erroneously diagnosed and treated as pyorrhea alveolaris. Such erroneous diagnosis is being constantly made by self-styled pyorrhea specialists.

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Fig. 17. This shows a case of pericemental abscess surrounding the lower half of the mesial root. The vitality of the pulp had not been impaired.

Fig. 18. This shows blind abscesses imprisoned under roots used in bridgework. There was no external evidence of inflammation nor any discomfort noticed by the patient.

Fig. 19. This shows one of the very common types of blind abscess when the pulp has died as the result of placing a gold shell crown over the root of the tooth. In such cases there generally is no discomfort.

Fig. 20. This is a radiograph taken a few months ago, showing a similar gold shell crown over a lower bicuspid with a well marked granuloma at the end of the root. The tooth was subsequently extracted under the direction of Dr. Henry James, who will describe the results of this particular case of infection. Cultures made by him from this granuloma produced the streptococcus viridans.

Fig. 21. This is a radiograph taken two years after amputation of the end of an upper central incisor. New alveolar structure is seen filling in the vacant space.

Fig. 22. This is a radiograph taken eight years after treatment of very severe alveolar abscesses by means of zinc electrolysis. The new alveolar structure in the previously diseased area is unmistakable.

These illustrations, together with all the evidence in the matter under discussion, should cause the medical profession to halt and consider if they are doing their duty for the protection of the public health.

It is a professional neglect to further defer action. No so-called special field taught in the medical colleges by specialists can show so great an etiologic bearing on infections involving the health of the community. Hence I believe that no one should be graduated from a medical college without having received a course of instruction and having passed an examination in the principles of stomatology.

Then only will physicians, as a whole, be trained to take their proper places as judges to determine if the community is receiving the benefits of scientific dentistry, which will not only increase the comforts of the individual, but operate as a material factor in increasing the longevity of those fortunate enough to secure its services.

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Local or Inhibitive Anesthesia.

By W. J. Hogan, D.D.S., Hartford, Conn., President Hartford Dental Society.

A method of producing such numbness in different parts of the body that operations may be performed without sensation of pain to the patient has been discovered and developed by careful research, study and experimentation by Dr. Wm. H. FitzGerald, a nose and throat specialist of Hartford.

The agent he uses to procure such condition is a simple metal probe tipped with absorbent cotton. This probe is applied with different degrees of pressure to ascertain areas in either the nose, throat or pharynx, and it causes anesthesia in the afflicted part of the body. Sometimes the cotton is dipped into a dilute solution of tri-chlor-acetic acid.

Already Dr. FitzGerald has given some few clinics. At St. Francis Hospital before the hospital staff as early as November last, he gave a demonstration of his method with most satisfactory results. The physicians saw the specialist anesthetize and operate upon several patients within his own specialty, even going so far as to puncture an ear drum, a most delicate and painful operation, and the patients felt no pain. Other operations were performed by the hospital physicians after Dr. FitzGerald had anesthetized the patients; and the operations were painless and successful. The doctors were much amazed and they testified that the discovery of this local anesthesia was marvelous.

On January 18th, four dentists, including the writer, witnessed a clinic given by Dr. FitzGerald. A patient, who had several teeth to be extracted was anesthetized by him, and when she said she felt no sensation in the jaw Dr. Sears immediately extracted the teeth without pain to the patient. Another patient was brought in and when the probe was placed upon different points in the nose and throat she traced sensation to different parts of the body. The eye of another was rendered so insensitive that there was no reflex action when the probe was touched to the eyeball.

Blood was drawn with a sharp instrument from the thumb of another patient without any feeling of pain.

I have watched Dr. FitzGerald about ten or twelve times and can now anesthetize my own eye by probing a certain area in my nose so that I do not experience any sensation when the eyeball is touched. I also anesthetized the gum in the region of the lower left cuspid in my mouth so that the doctor punctured the membrane without pain to me.

Wanting to try this upon someone else, I asked Dr. Sears to allow

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me to anesthetize his gum which I did by a pressure upon the lip. He felt no pain when I lanced his gum. Becoming bolder, with his permission, I anesthetized his eye so that he felt no sensation when pressure was put upon it.

On January 25th, we were with Dr. FitzGerald again, and after watching him for some time I became more enthusiastic and again anesthetized my own mouth. Dr. McLean punctured the mucous membrane in three places as far as the alveolar process and I felt no pain whatever.

On January 26th, at a special meeting of the Hartford Dental Society, Dr. FitzGerald was present and gave a few demonstrations of his method.

One of the dentists present complained of a headache, and at Dr. FitzGerald's request I cured the headache by applying pressure along the gum as far up as could be reached. The same dentist's lip was anesthetized so that it was punctured painlessly.

With only the aid of Dr. FitzGerald's method a six-year molar was extracted from a woman's jaw, while she felt no pain. The ear lobe of another woman was so anesthetized, and a tiny instrument was pushed through it.

There were present at this meeting about thirty-five dentists and two physicians, all of whom were interested and enthusiastic, and Dr. FitzGerald was warmly thanked. One very conservative dentist of ripe age, whose name would give great weight to any opinion, said he was glad to have lived to see such a wonderful discovery.

Dr. Edwin Bowers, a well-known magazine writer, spent several days in Hartford watching Dr. FitzGerald and wrote a lengthy article upon his observations.

The article appeared in the magazine section of the New York *World*, dated December 28, 1913.

Tooth Brush Drill.

At the annual dinner of the Lecture Staff and Mouth Hygiene Committee of the Second District Dental Society, recently held at the Hotel Clarendon in Brooklyn, Dr. Albert H. Stevenson introduced a genuine surprise by having an exhibition of the "tooth brush drill."

It has long been desirable to have a tooth brush drill so formulated that it could be taught to large numbers of children at one time. Dr. Stevenson seems to have accomplished this. At the dinner he brought in ten boys, members of one of the Boy Scout camps. They had only received one lesson in the drill and yet they went through it accurately,

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thus demonstrating its practicability. Dr. Stevenson also reported that the drill has been tried out in schools and found to be practical. The children enjoy it, and this novel form of instruction impresses upon their minds this method of cleaning in such a way that they adopt it as a habit. The method of using the tooth brush is that advocated by Dr. A. C. Fones.

Tooth Brush Drill.

The following is the formula for the drill:

ATTENTION:

(All in line, elbows close to side, with brushes in right hands and cups in left.)

1. Ready—Dip.
2. Outside Surfaces. (Brush inserted under cheek and teeth closed. Motion, circular including upper and lower teeth and gums.)

Left Side—	Ready—	(Count)	1—16	Dip
Right "	"	"	1—16	"
Front	"	"	1—16	"

3. Inside Surfaces. (Mouth wide open, straight motion, front to back.)

Upper	Left Side—	Ready—	(Count)	1—16	Dip
	Right "	"	"	1—16	"
	Front	"	"	1—16	"
Lower	Left Side—	Ready—	(Count)	1—16	Dip
	Right "	"	"	1—16	"
	Front	"	"	1—16	"

4. Chewing Surfaces. (Scrubbing vigorously.)

Upper	Left Side—	Ready—	(Count)	1—16	Dip
	Right "	"	"	1—16	"
Lower	Left "	"	"	1—16	"
	Right "	"	"	1—16	"

5. Rinse Brush (shaking off excess water on edge of cup.)

N. B. Counting by leader should be rather brisk, but even and allowing plenty of time for dipping and shaking of the brushes.

MATERIALS:

1. Tooth Brushes—not too large for children's mouths.
2. Individual Cups (paper preferably) to be half filled with water by monitor.
3. One or two large pitches of water, each in charge of a monitor who half fills the cups.

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The Miller Memorial.

To the Dentists of America.

GENTLEMEN: The committee appointed by the Ohio State Dental Society at the 1909 meeting, for the purpose of raising funds for an American memorial to the late Dr. W. D. Miller, desire to make the following report:

Funds have been received from the following States: Alabama, $25.00; Arizona, $25.00; Arkansas, $50.00; California, $60.00; Colorado, $82.00; Connecticut, $50.00; Georgia, $60.00; Illinois, $531.00; Iowa, $200.00; Indiana, $75.00; Kansas, $134.50; Kentucky, $105.00; Maine, $25.00; Massachusetts, $100.00; Michigan, $300.00; Minnesota, $100.00; Missouri, $100.00; Montana, $15.00; Nebraska, $100.00; New Hampshire, $25.00; New Mexico, $25.00; New York, $125.00; Ohio, $1,303.00; South Carolina, $25.00; North Dakota, $50.00; South Dakota, $15.00; Oklahoma, $31.00; Oregon, $50.00; Pennsylvania, $20.00; Tennessee, $50.00; Texas, $50.00; Utah, $14.00; Vermont, $20.00; Virginia. $50.00; West Virginia, $25.00; Washington, $50.00; Wisconsin, $25.00; Wyoming, $10.00. Total, $4,300.50; interest on this fund to December 1, 1913, amounts to $382.94, making a total in the hands of the treasurer, Dr. Weston A. Price, $4,683.44. Florida and Mississippi have each voted $50.00, but the amounts are not in the treasurer's hands at this date.

The memorial will consist of an eight-foot bronze statue of Dr. Miller, mounted on a seven-foot granite pedestal and will be placed in the lawn of the Public Library, the most appropriate site in the City of Columbus, the capitol of Dr. Miller's native State. Suitable tablets will be prepared and it is the desire of the committee to state on one that the monument is erected by funds from every State in the Union. If your State is not represented in the above list, we want your co-operation in placing it there.

It is hoped that sufficient funds ($5,500.00) will be in the treasury that steps can be taken at once toward the construction of this memorial, that it may be finished and ready for unveiling at the 1915 meeting which will be the fiftieth anniversary of the Ohio State Society. The valuable co-operation of the honorary committees in the several States is hereby acknowledged; they have made this memorial a reality.

Other professions have done honor to their distinguished dead, let us do the same for Dr. Miller, whose life was one of unselfish devotion to the scientific advancement of dentistry.

Yours very truly,

EDWARD C. MILLS, Chairman,
J. R. CALLAHAN,
S. D. RUGGLES,
Committee.

Columbus, Ohio, April 7, 1914.

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Mouth Hygiene Circular

Appended is a copy of the circular notice sent to parents or guardians of children who had secured dental inspection:

Detroit Board of Health.

To Parents and Guardians:

Diseases of the teeth have been named "The disease of the people."

The widespread existence of this disease and the great injury it does to the health of the child makes it one of the greatest factors in deciding the child's future.

The cure of the disease calls for the strong, united action of all persons having the care of children.

GOOD HEALTH DEPENDS ON GOOD TEETH BECAUSE

1. There cannot health without nourishment.

2. There cannot be nourishment unless the teeth break up (chew) the food so that the body can digest the food.

3. There cannot be good digestion unless the teeth are able to break the food, and bad teeth cannot do good work.

4. If there is not good digestion there cannot be good health. Medical investigations show that much of the disease of the teeth can be PREVENTED; also that the younger the child when the teeth are cared for the greater the benefit.

All this means that if the first or temporary set of teeth could be kept free from disease, the second or permanent set of teeth would be practically sound.

Children enter school life just before or during the most important dental period; namely, the cutting of the FIRST MOLAR TOOTH. THIS IS THE FIRST PERMANENT TOOTH.

This first tooth of the second set will not be healthy and sound if the first set of teeth is decayed or neglected. The other teeth of the second set will not be healthy if this first molar is decayed.

The one great cause in all decay of teeth is THE FAILURE TO KEEP THEM CLEAN.

There was a time when the wheat used for flour was not so finely powdered as it is to-day, and when modern inventions had not robbed bread of a coarseness that made the teeth clean and strong by chewing. The finely powdered wheat flour bread clings to the teeth and sets up fermentation. This causes decay of the teeth. This decay goes on faster during the night than during the day.

Teeth SHOULD be cleaned after each meal, but MUST be cleaned before going to bed each night if decay is to be prevented.

Teeth can be cleaned by BRUSHING or by passing silk floss between the teeth.

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Many children neglect to do this; then it becomes necessary to have the teeth cleaned and repaired by a dentist.

The Board of Health has gone over the whole problem of the care of children's teeth, and has prepared a plan which, it believes, will aid the children greatly in promoting good health.

The task is a big one and requires the co-operation of parents and teachers if the best results are to be gained.

Each parent or guardian is asked to assist in this work which means so much for the future of the children.

1. You are asked to buy a tooth brush for each child in the family.

2. You are asked to see that the childUSES THIS TOOTH BRUSH DAILY, especially before going to bed at night.

3. You are requested to take your child to your family dentist for examination and for treatment. If circumstances do not permit consulting a dentist at his office, the child may be treated free at one of the following dental clinics. You are asked to do this NOW.

Detroit Board of Health, 233 Antoine Street.....9 A.M. Daily
Bishop School, Adelaide and Rivard Streets.....9 A.M. Saturday
Newberry School, 29th near Jackson.....9 A.M. Saturday
St. Albertus School, 839 St. Aubin Avenue.....9 A.M. Saturday
Grace Hospital, John R. and Willis Avenue.....9 A.M. Saturday

Date.....

Dear.....

You are hereby notified that the dental examination made of.....
.....under the direction of the Detroit Board of Health shows necessity of treatment for
.....
.....
....., Principal
..... School

Please consult your dentist.

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Diagnosis with the Aid of the X-ray.

In the *Dental Review* for April, we find an editorial entitled *"The Fallibility of the X-ray,"* which caption is unfortunately phrased. The statements made in this editorial would not call for comment, but for the fact that the writer, Dr. C. N. Johnson is one of our most prominent practitioners, and one who has a tremendous number of admirers and followers. We are of the opinion that were Dr. Johnson rewriting this title he might have it read *"The Fallibility of Diagnoses made with the Aid of the X-ray."*

Dr. Johnson makes two statements which may be profitably discussed. As an evidence of the fallibility of the X-ray he cites a case in the following language.

"A patient had pain in the region of the left upper cuspid. This tooth was banded as the middle pier to a bridge. A radiograph was made of the region, and the verdict of the radiographer, who was an experienced operator, was that there was an extensive abscess cavity around the cuspid with the bone all absorbed. His remark was: 'If you cut the band the cuspid will drop out. Nothing holds it in place but the gold band.'

"The band was cut and the cuspid was found perfectly firm—the thing that nearly dropped out was the bridge, the cuspid having been its chief support. Thinking from the evidence of the radiograph that there must at least be an abscess on the cuspid it was drilled into—only to find a live pulp. Here, with the best intentions, a wrong was done the patient on the evidence of the X-ray, and it is probably not an isolated case."

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Limitations of Radiographs.

The writer would much like to see this radiograph, because it would be instructive to examine the evidence upon which this radiographer, who was an "experienced operator," made the reported diagnosis. It has been said that the radiograph is but "a record of varying densities." This in a sense is true, but it is not scientifically accurate. It would be more correct to say that the radiograph is "a record of variations in resistance to the ray." To make this more intelligible, a gold or brass wire placed in a root canal will cast a deeper shadow than will a steel wire. Lead will cast a shadow deeper than any of these, yet lead is less dense.

One who essays to interpret radiographs must be a judge of shadow values and his diagnosis will be worthless unless he also have such experience and knowledge of the conditions which might produce the shadows, that he may safely attribute them to their true causes. For example, a blind abscess at the apex of a tooth root will cause a dark shadow upon the film. Why? Because a part of the alveolar bone having been destroyed, the resistance to the ray is lessened, so that the film is more easily affected. But it is not sound diagnosis to declare that every shadow shown by a film at the apex of a root, demonstrates the presence of a blind abscess. Other factors must be considered. If the root is seen to be but partly filled, the diagnosis of blind abscess would probably be correct. If, however, the canal were seen to be well filled to the apex, a doubt would be raised. The good root filling might have been placed with inadequate precautions to cure the abscess, which may have persisted; or, the dentist might have entered through a fistulous track, and burred away the abscess and bone, and this bone may not have been replaced between the time of treatment and the moment of making the radiograph. Briefly, the shadow shown in a film at the apex of a tooth, merely indicates a lessened resistance to the ray in that region. Just what physical factors are the cause of this lessened resistance must be decided by other evidences present in the film, coupled with the clinical history of the case.

The diagnosis in the case cited by Dr. Johnson, should have created a doubt at once, since it would not be possible by any radiograph to determine that an abscess around a tooth was so extensive that the tooth

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would "drop out." It is well known that teeth may be quite firmly held in place by soft tissue alone, and without bony support. Moreover, the ray can only record conditions approximally of a tooth, while the attachment at the buccal, labial or lingual surfaces cannot be detected. Pyorrhea pockets are frequently seen along the approximal sides of roots which still may have healthy attachment with their sockets elsewhere.

The radiographer, in Dr. Johnson's case, read too much out of his radiograph. The fallibility was his and not to be attributed to the X-ray.

Radiographs of Root Fillings.

The other statement by Dr. Johnson, on which we would comment, reads as follows: "It does not prove that a root canal is not well filled because the radiograph fails to show a filling to the apex?"

Just what does Dr. Johnson mean by that? A root canal may be well filled with paraffin, perhaps, and the radiograph not shown any root filling. Yet a really good radiograph, read by a really good diagnostician, would show such a false shadow in the region of the canal that he would say: "That canal is either not filled, or else it is filled with some substance penetrable by the ray." Or, a radiograph might show a resistant filling not quite to the end, with the rest of the canal undiscernible. Dr. Johnson might call this well filled because the operator has done the best that could be done, since calcarious material rendered it impossible to penetrate further. But the expert radiographer would not say, "That is a bad root filling!" He would say, "The canal is not filled to the end"; and if there were also a shadow at the apex he would add, "If the canal cannot be cleaned out and filled to the end, the root should be amputated, since there is an abscess present." But if beyond the termination of the shadow of the root filling, the canal is distinctly outlined, the radiographer may unhesitatingly declare: "Bad root filling."

Two instances from practice will show how one gains experience in the matter of making diagnoses with the aid of the X-ray. Very shortly after the writer had begun to use the X-ray in his own office a young boy presented with two central incisors, which had been broken by a fall, the pulps dying. A radiograph showed what appeared to be very poor root fillings. His guess was that the previous dentist had used chloropercha freely, and a cone that was too small, and that the shrinkage of the chloropercha had resulted in the seemingly zig-zag root filling. An

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ingenious guess that proved to be erroneous. The canals were found filled with cotton on which had been placed an iodol paste. Investigation showed that this had only been meant to serve a temporary purpose, and the patient had never returned to the dentist.

With this experience in mind, the writer upon studying a radiograph recently, in conjunction with the clinical history of the case, made the guess that the canals were, to some extent, filled with some sort of mummifying paste, and upon opening the tooth the "root fillings" were easily picked out of the canals, and the nostrils readily detected the odor of iodoform.

Thus my very respected confrère should have attributed the fallibility to the radiographer, rather than to the ray, and in this connection we might say it is almost as hazardous to accept in a dental case, a radiographic diagnosis made by a medical radiographer, as it would be to accept in a medical case a diagnosis made by a dental radiographer. Indeed the safest method is for the dentist to be his own radiographer, as very often the angle at which the ray is used may alter the reading of a radiograph.

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"THERE ARE ALWAYS two sides to everything," says the Proverb, or the ❖ Epigram, or the Axiom, or whatever the wise phrase is, except when ❖ there are three sides, or four, or more; or in case the thing is a ball, and ❖ even then there are two sides if we view it in the right light; because ❖ if you place your ball where the sun will shine on it, it will cast a ❖ shadow; then there will be the sunny side and the shadow side.

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SO, OF COURSE, AS this little world of ours is round, and therefore a ❖ ball of a kind, it has its sunny side and its shadow side. That is not ❖ remarkable, but what is more than remarkable is that so many of the ❖ Earth's inhabitants should seem to prefer to live in the shadow and ❖ gloom, rather than to come out into the light and sunshine.

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THUS A NUMBER of folks may live in the same locality, but the locality ❖ never comes to be a neighborhood. And these folks may get to recog- ❖ nize the names of the local residents, especially the dental names, which, ❖ of course, stare at you from the window signs, but they never recog- ❖ nize that being in the same neighborhood they should be neighbors, ❖ and even neighborly.

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OFTEN WHEN WRITING of another dentist we mention him as "Our ❖ esteemed confrere." "Confreres" means "brothers together," and that ❖ is only another way of saying "neighbors."

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IT HAPPENED THAT I had a neighbor once; in fact, I had him for a long ❖ time; ten years. At least I knew my neighbor's name, because I re- ❖ member when he moved in, and when I first saw his name on his sign. ❖ Perhaps he never saw mine at all. I don't know. But at the time, I ❖ made inquiry and was told that he was an excellent dentist, and an ❖ excellent gentleman. But though we were neighbors, we never chanced ❖ to meet, and get really acquainted. And then I moved to a different ❖ locality.

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AND NOW, TO MY surprise, he has written me a little note. When I read it I did not quite grasp the meaning, so I read it over, and then I did understand. At first I hardly knew whether to reply or not. But I did reply, and at the moment considered the incident closed, to use the language of diplomacy.

BUT THE MORE I have thought of my neighbor's communication, the more it has been borne in upon me that a heart-to-heart, free and frank little talk on the general subject may be good for us all. One trouble in life is that we keep too many matters secret, when a little mutual airing of views might bring us out of the shadow of suspecting the next-door-man's intentions, into the sunshine of neighborliness.

NOW, THEREFORE, THOUGH I know that many will think this a private matter which should have no place in this department, I have concluded otherwise, and I have decided to take the risk of being misunderstood by some, hoping to be understood by, and possibly helpful to others.

BUT FIRST I MUST give you my old neighbor's letter. Here it is, as nearly as I can recall it. "Dear Editor, Don't you think you could give us more of 'Ottolengui' in the 'Items of Interest'? Perhaps you might, by leaving out the advertisements. T. R. is a back number now."

AND THEN HE signed his full name, but I am not sure that the communication was meant for publication, so will omit it. That is not the point anyway. The real grist which must be ground in the mill comes to this: "Is the editor of 'Items of Interest' suffering from exaggerated ego?" and the trouble is—but that reminds me of a story.

ONCE ON A TIME a foreign diplomat, resident in Washington, D. C., earned the ill-will of the Correspondent of a great Metropolitan daily, and said Correspondent lost no opportunity to stab said Diplomat with his red-inky pen till it almost seemed that he was shedding the scarlet blood of the foreigner. Sometimes he said that the Diplomat had been "Sent from his Country for his Country's good." This is known as the "stab diplomatic." Again he announced that "It is rumored that a certain diplomat, whose name begins with 'R' and ends with 'osini,' only escaped jail at home, because the political influence of powerful friends, obtained for him his diplomatic post, wherein his peculiar talents might be turned to the advantage of his political faction. This rumor, however, has not been confirmed." This is recognized as the "attack reportorial." It escapes being libelous by its technical lack of assertion.

THE CORRESPONDENT raved on, but the Diplomat raved not. The Correspondent dubbed the Diplomat with every criminal title that could be compassed in phrases reportorial though not actionable, but the Diplomat refused to come out of the sunshine of conscious righteousness into the shadow of unseemly dispute. And he daily read the Correspondent's diatribes and smiled.

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BUT CAME A DAY when the Diplomat ceased to smile. The Correspondent at last found the rift in his armor, thrust in his pen and turned it around, so to speak. In rage the Diplomat rushed to his Nearest Friend and said: "See what that Scoundrel has called me now?" And his Friend read, and wondered. "Why," said he, "you surprise me. Before this he has called you everything from a swindler to a murderer, and you have smiled. Why are you angry now? All he says here is that you are a fool?"

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"EXACTLY SO," replied the Diplomat. "But, don't you see, when he tells his readers that I am a swindler or a murderer I tolerate his stupid tales, because in my heart I know that they are false. But when he says that I am a fool, how am I to know whether he lies or not?"

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AFTER THOROUGHLY DIGESTING the moral of this narrative, and it is a highly moral tale, let us consider my neighbor's very neighborly note. Why did he write it? Evidently he thought that there was too much "Ottolengui" in the May issue of "Items of Interest," and there really was quite a good deal of Ottolengui's manuscript printed therein. But let us analyze this a moment. No exception can be taken to the presence of the editorial, because custom demands that the editor should write editorials. This custom is not popular with editors either. If you doubt me ask any editor. Then there were a few pages devoted to this department. In the language of the Bard of East Aurora, this was all "good stuff" and though the language was the editor's, the substance was from the pens of abler men. There was, however, a lengthy article entitled, "The Physiological and Pathological Resorption of Tooth Roots," which was read a year ago before the American Society of Orthodontists.

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POSSIBLY MY NEIGHBOR did not like this, first because it was in the Department of Orthodontia, and secondly, because it was lengthy. I cannot but wonder whether my neighbor read this article or not, and somehow I conclude that he did not. Had he done so he must have discovered that though in the department of orthodontia (because read before an orthodontic society whose proceedings we publish), it dealt with a subject of vast importance to every practitioner, and that it related an unrecorded, if not a heretofore unknown fact, viz.: that permanent teeth may lose their roots by resorption, just as do the temporary teeth, without death of the pulp and without loosening of the teeth until they are really lost. It is of tremendous interest to orthodontists to determine whether orthodontic interference can inaugurate such root destruction, and it is of paramount importance that the general practitioner, who takes the responsibility of selecting an orthodontist for an innocent and helpless child, whose parents know absolutely nothing of the hazzards of the work, not alone should know that the specialist is competent, but that he should himself be able to judge of the progress of what the specialist may be doing or undertaking.

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AND THIS WILL be a good place to pause a moment and once more declare that the Department of Orthodontia is maintained, not solely for the orthodontic specialists who find their practices mainly in the large cities, but for the information and post-graduate instruction of general practitioners in localities, where there may be no exclusive orthodontic specialist; and also for the benefit of the general practitioner who, while not correcting malocclusions himself, should be in the position to supervise the progress of work done for children of his patients.

⁂ ⁂ ⁂

THUS, WHILE IT MAY be true that there was a good deal of "Ottolengui" in our May issue, just what does my neighbor mean by his communication? Is it his idea that outside of the editorials, which custom compels him to write, the editor of a dental periodical must keep himself out of print? Does he mean that a dental editor should not be a member of dental societies, nor read papers, nor take part in discussions? Does he think that an editor who may thus efface himself will produce a better magazine? Or is it not just barely possible that an editor who does keep in touch with society work, and who does practice dentistry, and who does meet the obstacles to success which every practical man must solve as they occur day by day, might perhaps, because of all this, be a little better fitted to determine what to print and what to eliminate. Is it egotism, or is it neighborliness that prompts an editor to work a year or two on some dental problem, and then publish his findings? Frankly, I cannot myself answer the question. Perhaps it is egotism only when the editor publishes it in his own magazine. But what is a fellow to do when the material belongs to a society whose transactions he regularly prints?

⁂ ⁂ ⁂

AND NOW, KIND CONFRERES, having admitted you, as it were, into my confidence, advise with me. Put yourselves in my place, if you can, and decide just how you would have replied to my neighbor's letter, if you had been an editor, and he had been your neighbor. And now let me tell you how I answered him. These are not the exact words, but the substance is the same. "Dear Doctor, I have your rather odd postal card, and would like to make a suggestion to you. You must have some individual methods which are useful to yourself, and which would be equally useful to your confreres, if you would but publish descriptions of them. I should be glad to consider a manuscript from you. Cordially yours, etc."

⁂ ⁂ ⁂

PERHAPS I MAY BE wrong, but it does seem to me that there we have the human viewpoint. So many of us are more willing to tell another fellow how to do it, than we are to turn in and help him. There is now, and always has been, a demand for short articles. That terrible fellow, the "busy dentist," just can't spare time to read much over half a page. Therefore he would welcome half-page articles, which tell him, not why a thing should be done, but the way to do it, and he wants this practical information in the fewest possible words. But he is not only so busy that he cannot read, but he seems to be so busy that he cannot write either, and that is not very neighborly, is it?

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WHAT IS THE editor person to do about this? He cannot print these nice, crisp, practical, short articles, unless somebody writes them. And if he does some writing himself, and tries to inspire others to write also, why, Presto! He has "caputis incrementum enorme," exaggerated ego, paranoia, or something. "Oh, well! Perhaps so. Perhaps, also, he is a fool for his pains. I do not know!"

⁂ ⁂ ⁂

RIGHT HERE SEEMS TO BE a good place for a letter from Dr. Thaddeus P. Hyatt, in reply to some remarks by E. J. K., which appeared in this Department in the April issue. Dr. Hyatt has the courage of his convictions, which translated means that he is not afraid to say what he thinks.

⁂ ⁂ ⁂

"I AM READING with interest your new department in the 'Items of Interest,' and believe it is only right that someone should reply to the remarks of one called E. J. K. My first impression on reading these remarks was to recall a nursery rhyme which went somewhat as follows:

"Baby, Baby Bunting, your father has gone a-hunting,
To find some rabbit skins to wrap poor Baby Bunting in.

⁂ ⁂ ⁂

"E. J. K. SHOULD UNDERSTAND, that the so-called Old Guard of any and all societies is recruited from the ranks of those who have had sufficient courage to express themselves in any 'icy atmosphere,' or even in the heated air of Hades and thus have gained the strength and the ability to qualify as candidates for the company of the Old Guard. If E. J. K., or any of the 'little fellows,' have good ideas let them express them in open meetings. The Old Guard cannot kill them, even if they do freeze them and turn their ideas into little icicles and lay them in cold storage.

⁂ ⁂ ⁂

"I AM DISGUSTED at hearing these remarks made so often, for if the truth be told it will be found that members of the Old Guard are tired of having so often to get up at meetings and say something to fill in awkward pauses, just because these little fellows who, even though their ideas may be good, are themselves so weak and timid they are afraid of catching cold and so they say nothing. But after the meeting, by and among themselves hear them chatter and clatter. Says one little weakling, standing up so proudly, 'Say, boys, if I only had had a chance to speak to-night I'd have shown old Generousheart he did not know a thing of what he was talking about,' etc., etc.

⁂ ⁂ ⁂

"NOW, I SAY ALL THIS quite frankly and freely, for I know no one considers me a member of the Old Guard. Yet I have spoken at local and State meetings, and ofttimes have been laughed at, and am still alive, and do not feel one bit cold or even chilled. I have expressed my ideas at meetings knowing full well that if they were bad they would be soon forgotten and sooner forgiven, and if good they will live and prove of use and value even if at first not appreciated. Those who wait until they feel sure they will receive the approbation and approval of all the

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members will wait a long and lonesome wait, and I doubt if any man's life is long enough to realize this happy condition. I find the rule is generally true that it is the little fellows that are most ungenerous in their attitude and criticism, and this is because they are so little. It is the big fellows of the Old Guard who are the first to welcome and encourage the young beginner in his efforts to contribute something toward the uplift and help of our profession.

"LET E. J. K. BRACE UP and jump into the ring and win his spurs. Faint heart ne'er won fair lady, nor will the backward and timid contributor to dentistry receive recognition, while he sits in the back row at meetings doing nothing but complain because he is not waited upon by the older members and carried to the platform and applauded for every word he utters. I am not ashamed of my name, nor the sentiments I have expressed, and you may print both, or throw the whole thing into your waste paper basket, which I sincerely trust will always be full and overflowing."

I FEEL SURE that Brother Hyatt is a good neighbor.



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New Cure for Pyorrhea Alveolaris.

Editor ITEMS OF INTEREST.

DEAR SIR: I wish to report a new cure for pyorrhea. At least, I have never heard of this method, although it may be old.

My first case was in my own mouth—a lower cuspid having a pocket on the lingual side extending about a third of the way down the root. I had treated it myself and had had others treat it also. But no cure. Finally, as an experiment, I took a sharp lance and cut the gum away, eliminating the pocket entirely. That was the end of the pyorrhea on that tooth. It has been well for about a year without a sign of recurrence.

A recent case—a young lady with upper lateral, lower cuspid and lateral very badly affected. The upper lateral had a pocket extending apparently to the end of the root. The lower tooth about half-way down, discharging a large amount of pus and very sore. I advised extraction as the case seemed hopeless. The patient begged me so strongly to save her teeth that I decided to try cutting away the gum tissue. After cocaining the gums, I lanced away all the gum down to sound alveolar process. Fortunately, these teeth were not affected much lingually. But the upper lateral I had to cut until the end of the root was exposed on the labial side. She also had a couple of molars and bicuspids which I treated in the same way. The only after-tretament I gave them was to disinfect them several times and remove the deposits, which, of course, could be plainly seen after the gum was cut away. The first treatment was on January 16th. At the present time, March 7th, the gum is perfectly healthy and no pus. In fact, there has been no pus since the first operation.

I conclude from these cases, that we can cure pyorrhea by eliminating the pocket, either with medicines or with the knife. The latter being quicker and certain, why not use it? These are remarkable cases to me, as under ordinary circumstances anyone would have condemned the teeth to the forceps. Have treated several other cases in the same way

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with uniform success. I would be pleased to have your comments on this treatment. I am,

Respectfully,

T. B. HECKERT, D.D.S.

Wayne, Nebr., March 7, 1914.

March 14, 1914.

DR. THOS. B. HECKERT,
Wayne, Nebr.

MY DEAR DOCTOR:

Your recent communication in regard to "a new cure for pyorrhea" is quite interesting.

By an odd coincidence your letter reached me on Tuesday morning of this week and on Monday evening, being the night previous to the receipt of your letter, I heard a paper read by Dr. Howard Stewart on the treatment of pyorrhea. One of the methods advocated by him was the incision of the part to the apex of the root in order to facilitate thorough cleansing. This he claims to have given to the profession some years ago. This proves two things; that many minds may originate the same methods and, secondly, that it takes some time for the whole profession to be informed on any subject.

Cordially yours,

R. OTTOLENGUI.

DR. R. OTTOLENGUI,
New York.

MY DEAR DOCTOR:

Thank you for the kind letter in regard to my treatment for pyorrhea. Dr. Stewart's method is not just the same as mine. I cut the gum away entirely and claim that this alone will cure any case of pyorrhea where there is sufficient alveolar process to retain the tooth. This method, of course, is most applicable to those cases where not much bone is lost. Incisors and cuspids are most easily operated on. Molars and bicuspids are more difficult. All the after-treatment needed is a mild antiseptic wash, and, of course, the roots should be scaled after the operation of cutting away the gums.

The loss of gum tissue might be objected to, but to my mind, it is preferable to have a healthy tooth uncovered than a diseased one covered, and I have had several remarkable cures with just the one treatment of cutting away the gum tissue.

I am not concerned about priority of discovery, but would be pleased

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if you or some of your friends would try this out and report results in your journal. I perhaps am a little too enthusiastic, but I can say that I never have felt really sure of curing a case of pyorrhea until I commenced using this method.

Fortunately, most cases of pyorrhea commence on the labial side, so that it is easy to operate, and by cutting away a little of the gum tissue we may be able to stop its progress.

Thanking you again for the interest you have shown, I am,

Fraternally,

T. B. HECKERT.

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National Society Meetings.

American Institute of Dental Teachers, Ann Arbor, Mich, January 28-30, 1915.
Secretary, Dr. J. F. Biddle, 517 Arch St., N. S., Pittsburgh, Pa.

National Dental Association, Rochester, N. Y., July 7-10, 1914.
Secretary, Dr. Otto U. King, Huntington, Ind.

American Society of Orthodontists, Toronto, Canada, July 2-3, 1914.
Secretary, Dr. Wm. Ernest Walker, 629-631 Maison Blanche, New Orleans, La.

Panama-Pacific Dental Congress, San Francisco, Cal., 1915.
Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

European Orthodontia Society, seventh annual meeting, Paris. Grand Hotel Continental, 3 Rue Castiglione, Tuesday, July 28th; Wednesday, July 29th. Clinics, Saturay, August 1st.
Secretary, G. Lind, 542 Keizersgracht, Amsterdam, Holland.

State Society Meetings.

Arkansas State Dental Association, Little Rock, Ark., June 4, 5, 6, 1914.
Secretary, Dr. C. L. Hunt, Fort Smith, Ark.

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California State Dental Association and Southern California Dental Association, Yosemite Valley, Cal., June 29-30, July 1-2, 1914.
Secretary, Dr. E. E. Evans, Union Savings Bank Bldg., Oakland, Cal.

Colorado State Dental Society, Manitou, Colo., June 25, 26, 27, 1914.

Florida State Dental Society, Atlantic Beach, Fla., July 1-2-3, 1914.
Secretary, Dr. Alice P. Butler, Gainesville, Fla.

Georgia State Dental Society, Atlanta, Ga., June 4-6, 1914.
Secretary, Dr. M. M. Forbes, Candler Bldg., Atlanta, Ga.

Louisiana State Dental Society, Baton Rouge, La., June 4-6, 1914.
Secretary, Dr. E. B. Ducasse, Maison Blanche, New Orleans, La.

Maine Dental Society, Augusta, Me., June 25-27, 1914.
Secretary, Dr. I. E. Pendleton, Lewiston, Me.

Maryland State Dental Association, Baltimore, Md., June 11-12, 1914.
Secretary, Dr. F. F. Drew, 701 N. Howard St., Baltimore, Md.

Minnesota State Dental Association, Duluth, Minn., August 6-8, 1914.
Secretary, Dr. Benjamin Sandy, Syndicate Bldg., Minneapolis, Minn.

Mississippi Dental Association, Vicksburg, Miss., June 23-25, 1914.
Secretary, Dr. M. B. Varnado, Osyka, Miss.

Montana State Dental Society, Great Falls, Montana, June 11-12-13, 1914.
Secretary, Dr. F. W. Adams, 14-15 Chicago Block, Billings, Montana.

New Hampshire State Dental Society, Weirs, N. H., June 17-19, 1914.
Secretary, Dr. Louis I. Moulton, Concord, N. H.

New Jersey State Dental Society, Ocean Grove, N. J., July 15-18, 1914.
Secretary, Dr. John C. Forsyth, 430 E. State St., Trenton, N. J.

North Carolina Dental Society, Hendersonville, N. C., June 24-27. 1914.
Secretary, Dr. J. Martin Fleming, Raleigh, N. C.

Ohio State Dental Society, Columbus, O., December 1-3, 1914.
Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

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PENNSYLVANIA STATE DENTAL SOCIETY, Phila., Pa., June 30, July 1-2, 1914.
Secretary, Dr. Luther M. Weaver, Phila., Pa.

TENNESSEE STATE DENTAL ASSOCIATION, Chattanooga, Tenn., June 25-26-27, 1914.
Secretary, Dr. C. O. Rhea, 625½ Church St., Nashville, Tenn.

UTAH STATE DENTAL SOCIETY, Logan, Utah, June 19-20, 1914.
Secretary, Dr. I. P. Stewart, 1st Nat. Bank Bldg., Logan, Utah.

VIRGINIA STATE DENTAL ASSOCIATION, Old Point Comfort, Va., July 1-3, 1914.
Secretary, Dr. C. B. Gifford, Norfolk, Va.

WEST VIRGINIA STATE DENTAL SOCIETY, Huntington, W. Va., August 12-14, 1914.
Secretary, Dr. A. C. Plant, 802 Schmulbach Bldg., Wheeling, W. Va.

WISCONSIN STATE DENTAL SOCIETY, Fond-du-Lac, Wis., July 14-16, 1914.
Secretary, Dr. O. G. Krause, Wells Bldg., Milwaukee, Wis.

National Dental Association.

TENTATIVE PROGRAM.

The National Dental Association will hold its 1914 meeting in Rochester, N. Y., July 7th to 10th. The House of Delegates will hold its first session on Monday, July 6th, at 11 A. M., and it is important that all delegates be present at this time.

The first general session will open at 11 A. M. Tuesday, July 7th, and the local committee have hopes that Governor Glynn will be present to make the address of welcome. This will be responded to by Dr. B. Holly Smith, Baltimore, Md. The president's address will be followed by an address by Dr. Victor C. Vaughn, president of the American Medical Association.

The second general session will be held in Convention Hall at 8 P. M. Tuesday and will be a symposium by the Research Commission with Drs. Weston A. Price, Thomas B. Hartzell and Russell W. Bunting as speakers. At the Wednesday evening general session Dr. Joseph C. Bloodgood (M.D.), of the John Hopkins University, will discuss "The Early Recognition of Pre-cancerous Lesions of the Mouth and Tongue." At the Thursday evening general session two selected papers will be presented from Sections I and III.

The program for the section meetings has not been entirely completed, and two or three papers will be added to the following list: Dr. J. R. Callahan, Cincinnati, "Some Phases of Root Canal Treatment";

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Dr. W. H. DeFord, Des Moines, "Some Phases of Eliminating Pain"; Dr. E. J. Eisen, Milwaukee, "Dental Radiography"; Dr. Herbert L. Wheeler, New York City, subject to be announced; Dr. Fred W. Gethro, Chicago, subject to be announced; Dr. J. D. Patterson, Kansas City, "Pyorrhea Alveolaris"; Dr. C. H. Oakman, Detroit, "Oral Hygiene"; Dr. Chalmers J. Lyons, Ann Arbor, "The Pathological Significance of Impacted Teeth"; Dr. Dayton Dunbar Campbell, Kansas City, "Some Basic Principles and Methods in the Reproduction of Mandibular Movements"; Dr. Wm. A. Giffin, Detroit, "Technique for Making Impressions and Models for the Construction of Artificial Dentures," demonstrated with motion pictures; Dr. A. J. Bush, Columbus, "Classification of Fixed Bridgework with Law Governing its Application"; Dr. Carl B. Case, Milwaukee, "Evolution of Root Movement"; Dr. Jules J. Sarrazin, New Orleans, "Properly Constructed Bridges and their Hygienic Care"; Dr. Homer C. Brown, Columbus, "The Responsibilities of the State Society Officers"; Dr. Otto U. King, Huntington, "The Business Side of the State Society Work."

The Clinic Committee is to present a progressive clinic Wednesday morning, commencing at 9:30. They have secured a list of exceptionally high-class clinicians for both the progressive and the general clinic. The general clinic will be given Friday morning and full details of the clinical program will be presented through the *National Bulletin* and later journals.

The local committee has selected the Powers Hotel as headquarters and reservations should be made as early as possible. A full list of hotels and rates will appear in the *National Bulletin.* This committee has made ample provisions for a large meeting. All except the evening general sessions will be held at the Exposition Park under most favorable conditions. The superintendent of the park has assured us that the temperature of these buildings can be regulated so that July weather need not interfere with our comfort.

All reputable practitioners of dentistry and medicine are cordially invited to attend this meeting.

Fraternally,

HOMER C. BROWN, President,
Columbus, Ohio.

OTTO U. KING, Gen. Sec'y,
Huntington, Ind.

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Railroad Arrangements for the National Meeting.

Delta Sigma Delta Special Train.

The annual meeting of the Delta Sigma Delta will be held in Rochester, N. Y., Monday, July 6th, being one day prior to the opening meeting of the National Dental Association. The banquet will be held the same evening. Headquarters at Hotel Powers.

The New York Auxiliary has completed arrangements with the New York Central Lines for a Special to leave the various cities as per schedule outlined, arriving Rochester at a convenient hour July 6th (see announcement of train, below). The special train will be made up of the latest type steel Pullman cars, electric lighted throughout and will be operated to Rochester on a fast schedule. Brothers in Boston and New England may connect with this train by leaving Boston via the Boston & Albany Railroad, making an immediate connection at Albany, or take these cars from "The Hub":

SUNDAY, JULY 5TH:

Lv.	St. Louis, Mo., via Big Four Route	11:30 A.M.
"	Indianapolis, Ind., via Big Four Route	5:50 P.M.
"	Cincinnati, O., via Big Four Route	6:05 P.M.
"	Dayton, O., via Big Four Route	7:45 P.M.
"	Springfield, O., via Big Four Route	8:30 P.M.
"	Columbus, O., via Big Four Route	9:55 P.M.
Ar.	Rochester, N. Y., via New York Central R. R.	9:21 A.M.

SUNDAY, JULY 5TH:

Lv.	Chicago, via Michigan Central R. R.	5:40 P.M.
"	Toledo, O., via Lake Shore & Mich. So. Ry.	11:15 P.M.
Ar.	Rochester, N. Y., via New York Central R. R.	8:45 A.M.

SUNDAY, JULY 5TH:

Lv.	Chicago, via Michigan Central R. R.	:40 P.M.
"	Grand Rapids, Mich., via Michigan Central R. R.	5:10 P.M.
Ar.	Rochester, N. Y., via New York Central R. R.	

		MONDAY	SUNDAY	
Lv.	New York, (Grand Central Terminal), via New York Central R. R.	8:30 A.M.	9:34 P.M.	11:35 P.M.
"	(125th Street Station), via New York Central R. R.		9:45 P.M.	11:46 P.M.
Ar.	Rochester, N. Y., via New York Central R. R.	4:05 P.M.	6:33 A.M.	8:16 A.M.

CONVENTION FARES TO ROCHESTER AND RETURN AND PULLMAN

FROM	R. R. FARE	D. ROOM	COMPT.	LOWER
St. Louis, Mo.	$23.50	$14.00	$11.50	$4.00
Indianapolis, Ind.	20.00	11.00	8.50	3.00
Cincinnati, O.	18.10	11.00	8.50	3.00

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CONVENTION FARES TO ROCHESTER AND RETURN AND PULLMAN
(*Continued*)

	R. R. FARE	D. ROOM	COMPT.	LOWER
Dayton, O.	$16.45	$9.00	$7.00	$2.50
Springfield, O.	15.90	9.00	7.00	2.50
Columbus, O.	14.20	9.00	7.00	2.50
Chicago, Ill.	21.10	11.00	8.50	3.00
Toledo, O.	13.70	7.00	6.00	2.00
Grand Rapids, Mich.	16.75	11.00	8.50	3.00
Cleveland, O.	10.35	7.00	6.00	2.00
New York, N. Y.	14.45	7.00	6.00	2.00
Boston, Mass.	16.70	9.00	7.00	2.50
Detroit, Mich.	11.60	....	....	....

The above fares are approximated, as exact fares are not yet available from Western points, but the above are considered nearly correct.

Members of the National Dental Association are cordially invited to join the Delta Sigma Delta Special, offering an exceptional opportunity to fraternize on the journey.

If you expect to visit New York City after the convention, inquire of your ticket agent the thirty, sixty and ninety day round trip fares and instruct him to route the ticket via New York Central Lines from Chicago, St. Louis or Cincinnati. Such tickets permit stopover at Rochester for ten days or less by depositing with agent at Station Ticket Office immediately on arrival.

For Pullman reservations to Rochester, please address the following, viz.:

Dr. Burton Lee Thorpe, 3605 Lindell Boulevard, St. Louis, Mo.
Dr. Wm. E. Kennedy, 316 Board Trade, Indianapolis, Ind.
Dr. W. H. Whitslar, 700 Schofield Building, Cleveland, O.
Dr. J. R. Callahan, 25 Garfield Place, Cincinnati, O.
Dr. D. C. Bacon, 31 State Street, Chicago, Ill.
Dr. R. Ottolengui, 80 West Fortieth Street, New York City.

The same train service is in effect for members of The National Dental Association who may wish to leave one day later, and the New York Central Lines is the only system operating Pullman cars to and through Rochester.

Xi Psi Phi Fraternity National Alumni Association Annual Meeting.

"Good-fellowship, not Politics"

PLACE—Rochester, N. Y.

DATE—July 6th. All functions will be held on this day so as not to conflict with the sessions of the National Dental Association.

HEADQUARTERS—Hotel Seneca. Register on arrival in the Xi Psi Phi Parlor on the Mezzanine. An entire floor has been reserved for our members.

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FUNCTIONS—Annual dinner in the large banquet hall of the hotel at 6 P. M. Members of international respect will do the toasting. Be sure to send your acceptance without further notice to Dr. George C. Lowe, 813 Chamber of Commerce Building, Rochester, N. Y., so that reservation may be made for you. *This is important* so that the correct number may be provided for.

The annual business session will immediately follow the banquet. Matters of the utmost importance will come up for disposal and your presence is, therefore, strongly urged.

MEMBERSHIP COMMITTEE—Kindly get in touch with Dr. C. C. Markey, 1436 Peoples' Gas Building, Chicago, Ill.

C. O. SIMPSON, Secretary,
St. Louis, Mo.

L. M. WAUGH, President,
Buffalo, N. Y.

Forsyth Dental Infirmary for Children

Permanent Staff. Salary $1000 per Year.

Examination of graduates in dentistry (of less than three years' standing), for appointments to positions on the permanent staff of this institution will be held a Boston, Mass., on June 8, 1914.

The Forsyth Dental Infirmary for Children is an institution founded by John Hamilton and Thomas Alexander Forsyth in momery of their brothers, James Bennett and George Henry Forsyth.

This institution which will have sixty-four dental chairs is expected to open in the fall of 1914. It is intended to care for the dental needs of 220,000 school children in Boston and its suburbs. The clinical department, splendidly equipped and presenting unequalled facilities for post-graduate study in dental prophylaxis, orthodontia and oral surgery, offers to a limited number of recent dental graduates the opportunity to serve as members of its permanent staff at a salary of $1,000 per year.

Appointments will be made for one or two years.

Members of this staff will be entitled to the advantages of reports and clinics by experts in the various branches of dentistry, from different parts of the world.

A diploma of service will be issued to each member of this staff who has completed his term to the satisfaction of the trustees.

Successful candidates for positions on this staff will be required to pass the examination of the Massachusetts State Board of Registration in Dentistry.

Applications for the above positions should be made not later than June 4, 1914, to the director, Harold DeW. Cross, D.M.D., No. 149

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Tremont Street, Boston, Mass., who will gladly furnish information to those interested.

Permanent Staff, Half Time Service. Salary $300 per Year.

The appointments for this service are open to men and women graduates in dentistry, and offer unusual opportunities for clinical work in dental prophylaxis, orthodontia and oral surgery, in the best equipped and most modern institution of its kind in the world.

Appointments will be made for one year as follows:

Half time service, requiring twenty-four hours per week, salary $300; one-third time service, requiring sixteen hours per week, salary $100; and will be made subject to satisfying the requirements of the Massachusetts State Board of Registration in Dentistry.

A diploma of service will be issued to those who have completed their term to the satisfaction of the trustees.

Members of this staff will be entitled to the advantages of reports and clinics by experts in the various branches of dentistry, from different parts of the world.

All material and necessary operating instruments will be furnished; up-to-date apparatus, including electric engines, sterile instrument trays, fountain cuspidors, compressed air and modern operating-room-type lavatories will be available for use.

Applications for the above positions should be made not later than June 4, 1914, to the director, Harold DeW. Cross, D.M.D., No. 149 Tremont Street, Boston, Mass., who will gladly furnish information to those interested.

Board of Dental Examiners of North Dakota.

The next regular meeting of the North Dakota Board of Dental Examiners will be held in Fargo, N. Dak., July 13, 14, 15 and 16, 1914. All applications for examinations must be in the hands of the secretary by July 3, 1914. For further information apply to

F. A. Bricker, Secretary.

Fargo, N. Dak.

New Mexico Board of Dental Examiners.

The New Mexico Board of Dental Examiners will meet at Tucumcari, New Mexico, July 6, 1914.

M. J. Moran, Secretary.

Deming, New Mexico.

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New Jersey State Dental Society.

The twin cities by the sea (Ocean Grove and Asbury Park) will again entertain the members and guests of the New Jersey State Dental Society. The forty-fourth annual convention of the society will be held in the North End Hotel, Ocean Grove, N. J., on July 15, 16, 17 and 18, 1914, beginning at 10 A. M. on Wednesday, July 15th.

The North End Hotel is one of the largest and finest on the Jersey coast and is situated directly on the beach front at the foot of Wesley Lake and within a moment's walk of the Asbury Park Casino and trolley. Connected with the hotel by a bridge over the board walk is a large pavilion built over the ocean. The second floor of this pavilion will be devoted exclusively to the exhibits and clinics.

Dr. Walter F. Barry, 220 Essex Avenue, Orange, N. J., is chairman of the Exhibit Committee and has made an ideal arrangement of space for the exhibits. Dr. Barry will be glad to furnish information regarding the rates and space still available.

The clinics will be in charge of Dr. James I. Woolverton, 228 W. State Street, Trenton, N. J. Plenty of space will be available so that crowding will be avoided and everyone will have a chance to see the clinics.

The meetings of the society and the reading of papers will take place in the hotel either in the American dining room or in the picture theatre as will be announced in the program, which will be issued about July 1st.

At the hotel end of the bridge a room will be reserved for the officers of the society as headquarters, and this will be the executive office and bureau of information during the convention.

A cordial invitation to attend is extended to all ethical practitioners.

JOHN C. FORSYTH, Secretary.

430 E. State Street, Trenton, N. J.

Idaho Board of Dental Examiners.

The next regular semi-annual meeting of the Idaho Board of Dental Examiners will be held at Boise, Idaho, on Wednesday, July 1, 1914, at 9 A. M., in the State Capitol building. Applications for examination must be made before July 1st. For blanks and further particulars apply to

DR. A. A. JESSUP, Secretary.

Boise, Idaho.

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Colorado State Dental Association.

The Twenty-eighth Annual Meeting of the Colorado State Dental Association will convene at Manitou, Colorado, June 25, 26, 27, 1914. A cordial invitation is extended to all ethical practitioners to attend our meeting.

Clinicians and exhibitors desiring accommodations will please address Dr. E. I. Backus, 719 Exchange Bank Building, Colorado Springs. Colorado. Any other information will be cheerfully furnished by the Secretary.

DR. EARL W. SPENCER, Secretary,
Pueblo, Col.

DR. GEO. Y. WILSON, President,
Colorado Springs, Col.

Minnesota State Dental Association.

The thirty-first annual meeting of the Minnesota State Dental Association will occur in Duluth, August 6, 7 and 8, 1914, at which time the officers of the society unite with the Duluth men in promising a most instructive and enjoyable meeting.

BENJAMIN SANDY, Secretary.

Texas State Board of Dental Examiners.

The next regular meeting of the Texas State Board of Dental Examiners, for examination of applicants for certificate to practice dentistry in the State of Texas, will be held in Dallas, Texas, June 22, 1914, at the high school building, beginning at 9:00 A. M.

No diplomas recognized, no interchange of licenses with other States. All applications, accompanied by the fee of $25.00, should be in the hands of the secretary not later than June 17th.

For further information address

C. M. MCCAULEY, Secretary.

Abilene, Texas.

Pennsylvania State Dental Society.

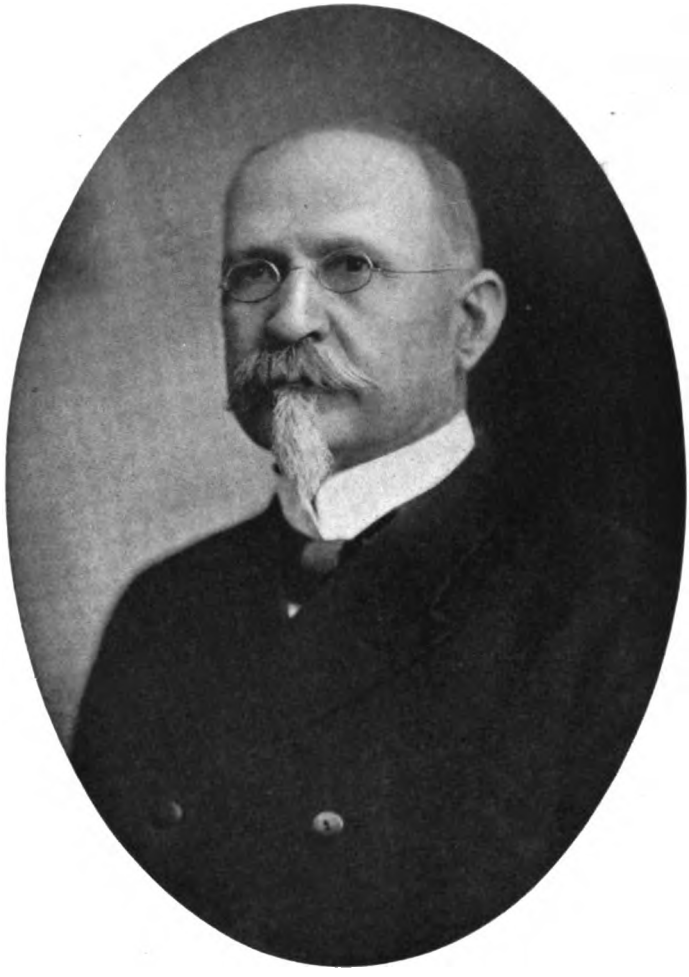
The Forty-sixth Annual Meeting of the Pennsylvania State Dental Society will be held at the Bellevue-Stratford Hotel in Philadelphia on June 30-July 1 and 2, 1914.

LUTHER M. WEAVER, Secretary.

7103 Woodland Avenue, Philadelphia, Pa.

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DR. VINES EDMUNDS TURNER

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Bacteriology in its Relationship to the Oral and Nasal Cavities.

By John Bethune Stein, M.D.
Professor of Physiology and Histology at the New York College of Dentistry, New York.

III.

Bacillus Typhosus.

The Bacillus Typhosus, or Bacillus of Eberth (1880) (Figs. 27-28), may appear in subjects attacked by typhoid fever, in the spleen; in the solitary and agminated glands of Peyer; in the mesenteric lymph nodes; in the liver, marrow of bone, less frequently in the lungs, meninges, testicles and tonsils. There are cases of typhoid fever where the Bacillus Typhosus cannot be found in the intestinal tract It is definitely established that the typhoid bacillus can enter the blood, producing a true septicemia (Marchoux, Ruediger, Busquet. Castellani, Widal, Courmont and Lesieur), and in patients having a severe or moderate typhoid fever the micro-organism may appear in the blood before the fifth day and remain till the end of the third week (Courmont). The Bacillus Typhosus has frequently been found in blood obtained from the "rose spots" (Thiemisch and Neuhaus, Neufeld, Besson). Rémy has proved the presence of the typhoid bacillus in the contents of the intestines, on the third day of the disease, before any ulceration of Peyer's patches. The number of typhoid bacilli in the feces increases up to the end of the first week, and then gradually decreases, and though

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usually at the end of the fourth week none are found, Chantemesse and Décobert have found the bacilli in the feces a month after the patient was cured.

In a certain number of cured typhoid patients (three per cent., according to Schneider), particularly women, the typhoid baccilus may exist in the body for months or even years. Its favorite lodging place seems to be the gall bladder, and from here it passes into the intestines. It is easily understood how these *"chronic bacillus carriers"* can transmit the disease. Chantemesse, Remlinger and Schneider think this micro-organism exists as a saprophyte in the intestines of healthy persons, but



Fig. 27.

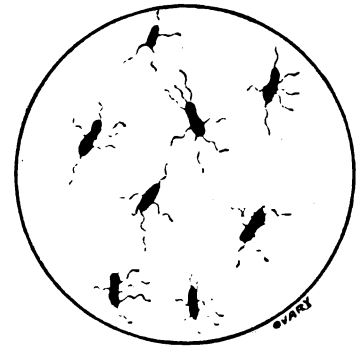


Fig. 28.

Fig. 27. Bacillus Typhosus (a) From a pure culture on agar, (b) From a pure culture on potatoe (From Macé). × 800.
Fig. 28. Bacillus Typhosus. Showing flagella (Modified from Macé). × 1500.

the investigations of Rémy, Courmont and Minelli indicate that this bacillus is found only in the intestines of those who have been infected. During the course of typhoid fever the Bacillus of Eberth may appear in the urine (Bouchard, Leitz, Neumann). Besson, from an examination of thirty-three typhoid cases, concludes that this micro-organism appears in the urine only when albumin is present (forty per cent. of the cases), and that it and the albumin disappear at the same time. Vincent, who has observed this bacillus in the urine in twenty per cent. of the cases of typhoid fever examined, has seen it persist after recovery; and thinks it reproduces itself in the urinary bladder. According to Horton Smith a light cystitis with pyuria may be occasioned by it. Numerous complications may be due to this micro-organism; as, pharyngitis, rhinopharyngitis, bronchopneumonia, abscesses, osteitis, adenitis, pleurisy and pericarditis. It has been found at the seat of old lesions. Widal reports it in an ovarian cyst and in a tubercular adenitis. It has frequently been detected in water, air bubbles in ice, the soil and in the dust of rooms

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which were occupied by persons with typhoid fever. It is accepted that the Bacillus coli and the Bacillus of Eberth are two different species.

Bacillus Coli Communis.

The Bacillus Coli Communis or Bacterium Coli Commune (Escherich, 1886) (Fig. 29), is met with normally in the intestinal tract of men and animals, even a few hours after birth. In the intestinal tract of healthy persons it is associated with at least fifty other species of micro-organisms, mostly anaërobes. Grimbert and Choquet have demonstrated it in the mouth, in twenty-five of sixty-five mouths examined, where, also, it is associated with about fifty other species of micro-

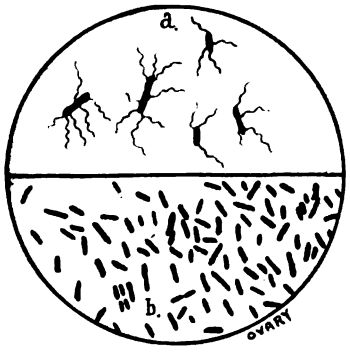


Fig 29.

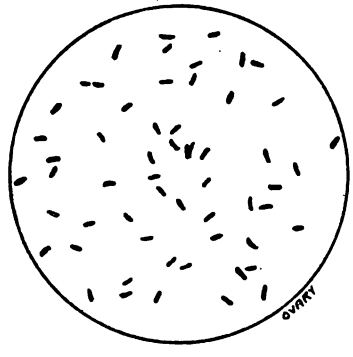


Fig. 30.

Fig. 29. Bacillus Coli Communis. (a) Showing flagella × 1500, (b) × 800. (Modified from Macé.)

Fig. 30. Bacillus Dysentericæ. × 700. (Modified from Macé.)

organisms, and it has been found on the hands (five to ten per cent.) of ordinarily cleanly individuals. The Bacillus Coli may become pathogenic, and produce a secondary infection in typhoid fever, colitis and cholera. It may complicate most of the diseases of the intestinal tract (Lesage, Sanarelli); is said to produce pharyngitis, bronchopneumonia, endocarditis, pericarditis and meningitis; has been found in the nuclei of gall stones (Kramer), and may pass into the blood and invade the gall bladder and bile ducts, producing a cholangitis and cholecystitis. Eighty per cent. of all urinary infections are said to be occasioned by this micro-organism (Rostoski). It is said to be the cause of a septicemia, presenting the clinical syndrome of any of the following diseases, viz: typhoid fever, enteritis, cholera infantum, peritonitis, salpingitis and metritis. It is the causal agent of most of the agonal and post mortem infections, and is found in the soil, dust and water which has been contaminated by animal dejecta.

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Bacillus Dysentericae.

Bacillary Dysentery, like typhoid fever, the scourage of military life, is caused by the Bacillus Dysentericæ (Chantemesse and Widal, 1888; Shiga, 1898; Kruse, 1900; Flexner, 1900) (Fig. 30).

This micro-organism is found in the stools, not only of persons suffering from dysentery, but also of those who are apparently well. Dysentery, like typhoid fever, appears to be disseminated by more or less direct contact with the carriers of the Bacillus Dysentericæ. The Bacillus Dysentericæ does not apear to live long outside of its host. There are a number of types of this bacillus called Bacilli pseudo-dysen-

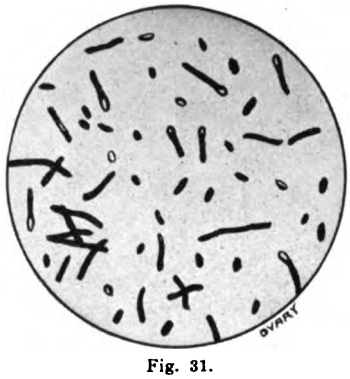


Fig. 31.



Fig. 32.

Fig. 31. Bacillus Botulinus. (Modified from van Ermenghem.)
Fig. 32. Bacillus of Influenza in the Nasal Mucus. (Modified from Kolle and Hetsch)

tericæ. They are all pathogenic. Chapin says "what is commonly called dysentery may be caused by a number of pathogenes, and the dysentery bacilli may cause diarrhœal symptoms quite different from typical dysentery.

An interesting case is cited by Dodge of a laboratory worker getting some of the culture of the Bacillus Dysentericæ in his eye. The tears which flowed profusely were swallowed by him, and twenty-four hours later he developed an attack of dysentery.

Bacillus Botulinus.

Botulismus or Atlantiasis is caused by the toxin of the Bacillus Botulinus (Van Ermenghen, 1895) (Fig. 31), following the ingestion of meat, sausages, fish or canned goods which are not fresh, and contain this micro-organism. The meat, sausages or fish may show no signs of putrefaction. Sometimes the canned goods have an abnormal odor or contain gas. The toxin in the ingested food is not found in all parts of it as the Bacillus Botulinus in anaërobic, and grows only at certain places

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in the food. Thus there are persons who escape this infection who, nevertheless, have eaten some of the same food which has infected a number of other persons.

The symptoms begin twenty-four to twenty-six hours after the ingestion of the food containing the Bacillus Botulinus. The toxin of this micro-organism has a particular affinity for the nuclei of origin of the cranial nerves, causing partial or complete paralyses, vaso-motor and secretory disturbances; such as, loss of accommodation, dilatation of the pupils, ptosis of the eyelids, diplopia, dryness and redness of the buccal and pharyngeal mucous membranes, suppression of the secretion of the

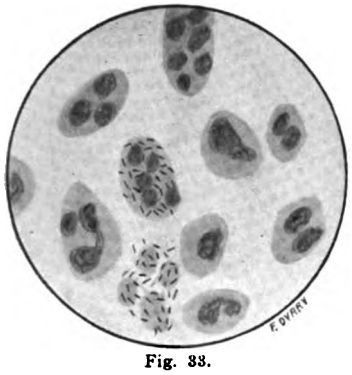


Fig. 33.

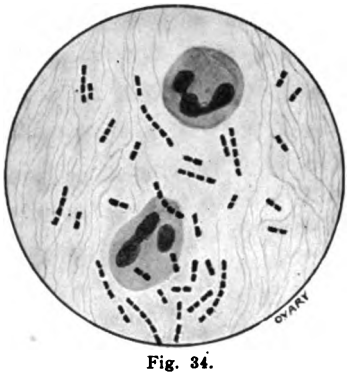


Fig. 34.

Fig. 33. Koch-Weeks Bacillus in the Exudate of an Acute Conjunctivitis, the Bacilli are seen mostly as Cell Inclusions of the Leucocytes. (Phagocytes.) × 1000. (Modified from Frieburg.)

Fig. 34. Morax-Axenfeld Bacillus or Diplobacillus of Subacute and Chronic Conjunctivitis in the Purulent Exudate of a Chronic Conjunctivitis. × 1000. (Modified from Macé.)

saliva and aphonia. Sometimes there is vomiting and diarrhœa, sometimes constipation. Often there is retention of urine. The sensorium is not affected, and the sensibility of the skin remains intact. Usually there is no fever, and when it is present it is secondary; caused by the constipation. If the patient has absorbed a large amount of the toxin he dies with the symptoms of an acute bulbar paralysis.

Bacillus Influenzae.

The Bacillus of Influenza (Pfeiffer, 1892) (Fig. 32), exists in the mouth, nasal secretions and respiratory tract of influenza patients, persists in the sputum for some weeks after recovery, and remains for a long time in chronic lesions, as in tuberculosis of the lungs. It has not been satisfactorily proved that this bacillus is the causal agent of influenza, although Meunier has found this micro-organism (four times in eight) in the blood of influenza subjects, and Ghedini during the course of an epidemic of influenza discovered its presence 64 times in 100

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in the blood of the median basilic vein, and 57 times in 100 in the material obtained by puncturing the spleen, and Rosenthal has found Pfeiffer's bacillus in the blood of the heart. Pfeiffer, however, never found his bacillus in the blood of persons having influenza. This micro-organism may cause, as a complication of influenza, pleurisy, meningitis and periostitis (Meunier). Investigators have endeavored, without success, to find Pfeiffer's bacillus in cases of epidemic influenza, caused by the Micrococcus catarrhalis, Pneumococcus, etc. Pfeiffer could not find his bacillus in subjects having influenza during the epidemic in 1899. Besson, during an epidemic in Rennes in 1897-1898, found this micro-organ-



Fig. 35.

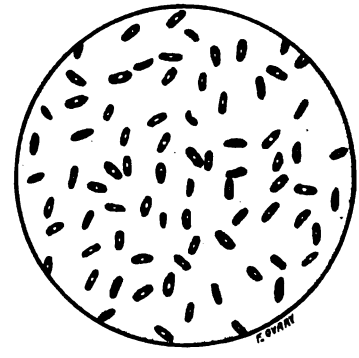


Fig. 36.

Fig. 35. Bacillus of Pertussis and Leucocytes in the Sputum. (Bordet and Gengou.)
Fig. 36. Bacillus Pestis. (Modified from Yersin.) × 1000.

ism in only eighty per cent. of the cases examined. In influenza, especially in the pulmonary lesions, other pathogenic micro-organisms are met with, particularly the Pneumococcus and Streptococcus. The Bacillus of influenza, or an organism closely resembling it, has been found in cases of pertussis and in bronchopneumonia and in healthy persons.

Bacillus of Koch-Weeks.

The Koch-Weeks Bacillus, or the Bacillus of Acute Contagious Conjunctivitis (Koch, 1883) Weeks, 1890) (Fig. 33), is the cause of a highly contagious form of conjunctivitis.

Morax-Axenfeld Bacillus.

The Morax-Axenfeld Bacillus or the Diplobacillus of Subacute and Chronic Conjunctivitis (Fig. 34), described by Morax (1896) and Axenfeld (1897), is a large diplobacillus which is found in the conjunctival secretion, either free or within the leucocytes.

The Gonococcus, Pneumococcus, Bacillus of Influenza, Bacillus diphtheriæ and the Strepetococcus can cause a conjunctivitis.

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Bacillus of Pertussis.

The Bacillus of Pertussis (Fig. 35), discovered by Bordet and Gengou (1906), in the sputum of children suffering from whooping cough, is thought by them to be the probable cause of this disease.

Seiffert has found this Bacillus of Bordet and Gengou in twelve of the sixteen cases of pertussis examined by him.

Reyher has shown that the stratified squamous epithelium covering the vocal cords and arytenoid cartilages is literally filled with these bacilli. This observation, if it is verified, explains why these two places are the places where the reflex is produced, which brings on the spasmodic attacks of coughing characteristic of the disease.

A number of experimenters have shown that intratracheal inoculations with this micro-organism in monkeys and young dogs causes a syndrome which closely resembles that of pertussis. The serum of patients having pertussis always fixes strongly the complement when applied to this bacillus, but does not always agglutinate the bacillus.

The serum of a horse immunized with cultures of the Bacillus of Bordet and Gengou, even when diluted to 1-5000, agglutinates strongly this micro-organism.

Porcelli has found this Bacillus of Bordet and Gengou in every one of the twenty cases of pertussis examined by him, and has also seen this micro-organism within the epithelial cells of the mouth.

This micro-organism can be easily differentiated from the Bacillus of influenza and its congeners which have been described by Jochmann and Krause, Czaplewski and Hensel.

Fränkel, Klimenko, Metchnikoff, Martha Wollstein and Finizio have confirmed the work of Bordet and Gengou on the Bacillus of Pertussis.

Bacillus Pestis.

The Plague Bacillus, Bacillus Pestis (Yersin and by Kitasato in 1894) (Fig. 36), is present in both the ganglionic or glandular, and pneumonic type of plague. In the glandular form of plague, this bacillus is met with in the pus from lymph nodes, at times in the blood and more rarely in the feces. In the pneumonic type the micro-organisms are observed in the lymph nodes, even when there are no buboes, often in the blood, and always in the sputum in enormous numbers. The bacilli have been discovered in the sputum eight days after devervescence, and then it was possible to prove their presence only by inoculation, and their virulence was much attenuated. This micro-organism has been found in the sections made from and the juice obtained from the lung and spleen. The infectious droplets discharged in coughing and the sputum of pneumonic plague patients is extremely infectious. In epidemics of the plague a large number of animals are infected at the

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same time as man. "The rat is the animal usually first infected. The plague, which is first a disease of the rat, soon becomes a disease of man" (Roux and Yersin.) The plague is transmitted from rat to rat, and from rat to man, through an intermediary organism, the flea. The Bacillus Pestis is contained in the flea's stomachal tube, and, after the death of the rat, the fleas leave its body. The fly may also play a part in the propagation of the plague, for the plague bacillus has been found in the bodies of dead flies (Yersin). The plague is rarely contracted by way of oral cavity. Wilm, however, cites a case where intestinal symptoms were marked showing at autopsy a "buboe" of the mesenteric lymph

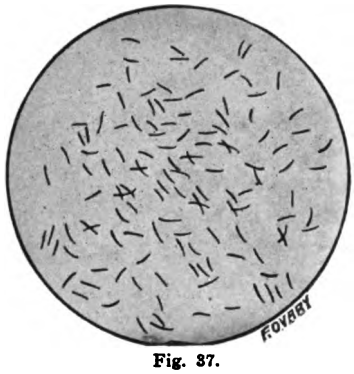


Fig. 37.

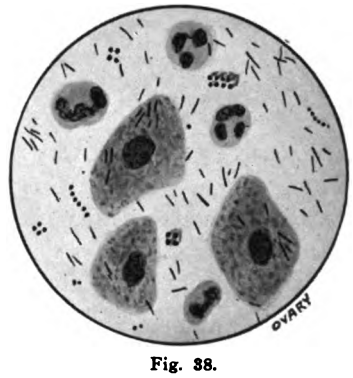


Fig. 38.

Fig. 37. Bacillus Mallei. × 900.

Fig. 38. Bacillus Tuberculosis, together with Streptococci, Sarcinæ, Leucocytes and Desquamated Epithelia in the Sputum. × 1000. (Modified from Macé.)

nodes. Klein and Simpson have shown that domestic animals and rats may be easily infected by the ingestion of food contaminated by the Bacillus Pestis. The plague bacillus conserves its activity in external media, in the soil of an infected locality (Yersin), in the dead bodies of rats for several weeks (Maassen) and in drinking water for about a month (Inghillori).

Bacillus Mallei.

The Bacillus Mallei (Löffler and Schütz, 1882) (Fig. 37), rarely produces glanders in man, although cases are on record where veterinarians, men about horses and laboratory workers, have been infected; the latter by means of fresh cultures. The nasal mucous membrane seems to be the place of predilection (nodules and ulcers), then the lymph nodes and the viscera, particularly the lungs and genital organs. The probable manner of infection is through some scratch or break in the skin. Ingestion of meat from animals afflicted with glanders or inhalation of the bacillus does not appear to cause the disease. It attacks most frequently the solipedes.

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Bacillus Tuberculosis.

Villemin (1865) showed that tuberculosis was a specific inoculable disease, and Koch (1884) proved that the Bacillus Tuberculosis, or Bacillus of Koch (Fig. 38) is the cause of both human and animal tuberculosis. The tubercle bacilli found in man and different animals are known as the bacilli of human, bovine, avian and piscine tuberculosis. Almost every animal species is susceptible to this disease. In spite of the opinion of Koch, the greater number of bacteriologists, basing their views upon a large number of facts, appear to consider the bacillus of bovine and human tuberculosis as identical. Each of these bacilli is best

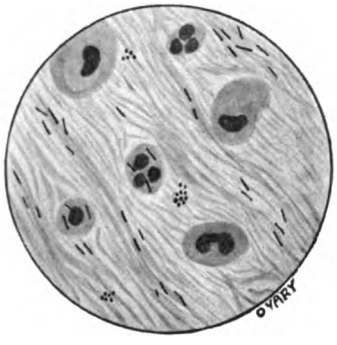


Fig. 39.

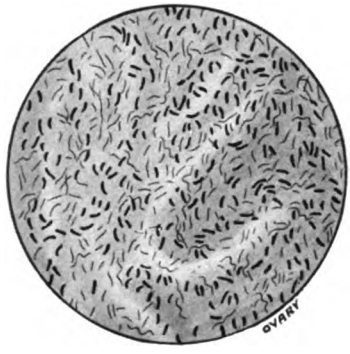


Fig. 40.

Fig. 39. Bacillus of Leprosy, Cocci and Leucocytes in the Nasal Mucus. × 1000.

Fig. 40. Spirillum Choleræ Asiaticæ in the Intestinal Contents of a Patient Dying from Asiatic Cholera. Two types of the micro-organism are seen: one the finer, a Spirillum, and the other a coarser, the so-called "Comma Bacillus." (Modified from Kolle and Hetsch.)

adapted to that species of animal which has acted as the host for it, but each bacillus can infect the other animal species. According to de Jong the bacillus of bovine tuberculosis seems to be more virulent than that of human tuberculosis, yet, by repeated inoculation of the goat with the latter micro-organism, it can be made as virulent for bovines as the bovine tubercle bacillus. Arloing, Dor and Courmont have contended for a long time that the bacilli of human and avian tuberculosis were similar and the result of experiments by Nocard, M. Koch and Lydia Rabinowitsch seems to confirm this view, and to prove that the bacillus of avian tuberculosis is only a variety of species of the Bacillus of Koch. Straus and Gamaleia, however, think that avian tuberculosis is caused by a special micro-organism.

Moeller, Sorge and Suess have succeeded in transforming the Bacillus Tuberculosis of man into the piscine type. Besson contends that the different tubercle bacilli have the same origin, and that an habitual

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parasitism in different animals has created different varieties. Such investigators as Arloing, Wolff, de Jong, von Behring, Moeller, Spronck, Krause, etc., agree upon the identity of the tubercle bacilli.

Man contracts tuberculosis either by the respiratory or digestive tract, or less frequently by the genito-urinary tract or skin. The tubercle bacillus is found in every manifestation of tuberculosis in man. It is held by von Behring that the infection takes place through the digestive tract, and the pulmonary tuberculosis of the adult is the evolution of the intestinal tuberculosis contracted in early life. This view seems to be confirmed by the French School, led by Calmette and Guérin, who, from numerous experiments by themselves and others are convinced that pulmonary tuberculosis which has not been produced by experimental infection of the lungs (insufflation of trachea, bronchi and lungs with material containing tubercle bacilli in suspension) always comes from an initial infection of the intestinal tract during the first years of life, which in the adult may leave no trace of its presence either in the mesenteric lymph nodes or abdominal viscera. According to Arloing, the so-called surgical types of tuberculosis (as distinguished from visceral tuberculosis, viz., tuberculosis of the skin, serous membranes, lymph nodes, joints, etc.), are caused by an attenuated type of the tubercle bacillus. Krompecher and Zimmermann are of the opinion that the tubercle bacillus conserves its entire virulence in these localized lesions, and that the slight tendency to extend results either from a particular resistance on the part of the invaded organism, or from the fact that the Bacillus Tuberculosis is influenced in its growth by the particular place in the organism where it endeavors to grow, or because the invading bacilli are few in number, and grow poorly in an unfavorable locality. Pyogenic micro-organisms are frequently associated with the tubercle bacillus in tubercular lesions. In tubercular lung cavities, the Staphylococcus pyogenes, Streptococcus, Pneumococcus, Pneumobacillus, Bacillus of blue pus, Micrococcus tetragenus and putrefactive micro-organisms are to be found in addition to the Bacillus of Koch, and the hectic fever is believed to be caused by the absorption of the toxins of these micro-organisms. In a tubercular adenitis or meningitis, etc., aside from the Bacillus of Koch, Pneumococci, Streptococci and Staphylococci may appear.

Lepra Bacillus.

Leprosy is caused by the Lepra Bacillus (Hansen, 1879) (Fig. 39). The inoculation of animals with the Lepra Bacillus or with tissue taken from lepra nodes was unsuccessful, excepting in those cases where Nicolle succeeded in infecting apes.

The Lepra Bacillus is found most frequently in the superficial connective tissues of the body (nose, mouth, skin), rarely in the organs.

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causing lepra nodes (lepra nodosa) and in the connective tissue sheaths of nerves (lepra anæsthetica) producing anesthesia and trophic disturbances.

Striker, from an observation of 153 cases of leprosy, says that: "the primary infection takes place through the nose; the clinical symptoms begin there; the relapses of the disease begin with nasal symptoms (epistaxis, congestion of the nasal mucous membrane, a sensation of heat, etc.), in incipient cases the Lepra Bacilli are first found in the nose, and remain latent there for long periods, and the nasal lesion, which is characteristic and entirely different from all other lepra lesions, is the only constant one in both the nodular and anesthetic forms of leprosy."

In a suspected case of leprosy the nasal mucus should be examined to determine the presence of the Bacillus of Leprosy.

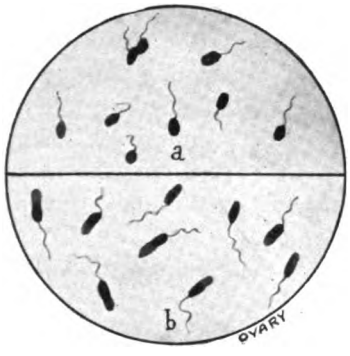


Fig. 41.

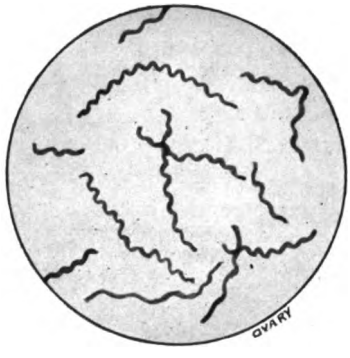


Fig. 42.

Fig. 41. Spirillum Choleræ Asiaticæ. (a) with a short flagellum, (b) with a long flagellum. × 1500. (Modified from Kolle and Hetsch.)

Fig. 42. Spirillum Choleræ Asiaticæ. Involution forms from an old bouillon culture. (Modified from Kolle and Hetsch.)

Spirillum Cholerae Asiaticae.

The Spirillum of Vibrio Choleræ Asiaticæ, called by Koch the "Comma Bacillus" (Koch, 1883) (Figs. 40, 41, 42), is the cause of Asiatic Cholera and is encountered in the contents of the intestines and dejecta of cholera patients. It localizes in the intestines and produces there a toxin which gives rise to the symptoms of the disease. The Spirillum Choloræ is polymorphic, and there exist a number of varieties more or less like the type described by Koch. In the absence of an epidemic of Asiatic cholera it is difficult to actually determine the presence of the Spirillum or Comma Bacillus of Koch, as not infrequently micro-organisms, morphologically analogous, if not identical with this micro-organism, are found in water and in the feces of healthy persons.

When Koch, returning from Egypt and India, where he had been

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sent by the German Imperial Government in 1883 to investigate the cause of Asiatic cholera, alleged that its causal agent was the Comma Bacillus, Pettenkofer, of Munich, doubted Koch's statement, and to prove that it was or was not true swallowed part of a culture of this micro-organism and escaped the disease. Some of his assistants did the same thing, and did not contract cholera. Metchnikoff also swallowed a portion of a culture of these micro-organisms, and escaped having cholera. But of twelve other assistants in the Pasteur Institute at Paris, who had swallowed portions of cultures of the Comma Bacillus of Koch, one conducted true Asiatic cholera with violent symptoms which nearly caused his death.

Emmerich, who also swallowed some of a pure culture of this bacillus, contracted a most severe attack of Asiatic cholera.

Oergel, an assistant at the Institute of Hygiene at Hamburg, while handling some cultures of the Spirillum Choleræ in the laboratory of this institution accidentally infected himself and contracting Asiatic cholera died in four days.

After the results of some of these experiments made with pure cultures of the Spirillum Choleræ upon the experimenters themselves no competent scientist doubted the specificity of the "Comma Bacillus of Koch."

I am indebted to Dr. Francis O'vary for the drawings of the cuts.

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The Tuttle Telescopic Porcelain Crowns—Modified.

By Montague Hart Tuttle, D.D.S., Atlanta, Ga.

I believe the wideawake, progressive and thinking class of men constituting the dental profession of to-day are the most earnest, sincere and useful body of men in the world. I believe every reputable dentist is doing his utmost to cope with the present demands upon him and seeking better methods to-day than he found yesterday. No class of men have done more good for humanity than the real thinking dentist. To enumerate the demands upon the present-day dental surgeon would fill a volume. This article will deal with one, of evergrowing interest—the demand for conserving the stumps of broken-down teeth. I do not believe there is an honest, thinking dentist in the profession who would amputate carious crowns for pivot work if he could avoid this disaster in a successful manner.

In August, 1912, the Items of Interest published an article on telescopic porcelain crowns, that seemed at that time to the author a satisfactory method of escape from crown butchery; but, like the old wooden peg crowns, acting on the principle of "spit and swell," those platinum base crowns needed modification.

To-day, if we have any regard for time and success, we will abandon platinum caps and making motled facings on this stuff forever. Let the dead past bury the dead, and let us rise to the highest sense of justice to ourselves and our clientele. Let us cast our crowns. Let us prepare the stump, take an impression, dismiss the patient, and cement the crown over the stump at the next sitting, the same as we would an inlay. Let us make our crowns outside of the mouth and avoid torturing wire

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measures, hammering bands into delicate tissues and painful articulations. Above all, let us save the stumps and avoid injury to the roots.

We know that the main strength of a tooth is in its crown body—a crown telescoped over this portion would be as strong in attachment as the uninjured tooth. A pivot crown is no stronger than the metal pin that maintains it in the weakened root.

Again, the present-day demand is to avoid cutting off sound teeth for abutment construction. Who will continue to destroy the crowns of faultless natural teeth to substitute anchorages for bridgework?

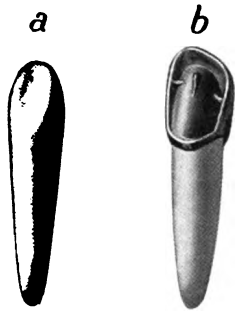


Fig. 1.

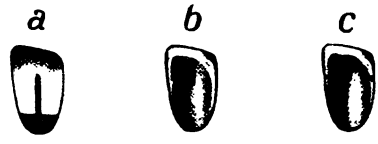


Fig. 2

There is a way out of it all. It is simple and can be done with dispatch. It has no secrets nor patent processes. Anything I might have that does nobody else any good can never be of any value to me. To prevent any manufacturer or individual from patenting these crowns described in this paper I hereby deed this work to the dental profession, with all the power vested in me as the inventor.

Technique of Construction.

Prepare the stump the same as for gold crowns. To allow for thickness of thin porcelain facing, grind the labial or buccal surfaces well back. If the pulp is involved, extirpate and fill canals.

The technique for constructing crowns for the anterior teeth is practically the same as for the posterior teeth. Take two plaster impressions of the stump and contiguous area. Run models in hard plaster.

From one model trim out a plaster root underneath and continuous with the stump to be crowned, being careful to preserve the axial surface of the stump as far up on the plaster root as the crown should be set without impinging. Fig. 1 A illustrates a plaster root with stump. These plaster roots are provided to individualize the stump and to facilitate holding and manipulating wax over stump, as will be described hereafter.

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The other model should be reserved for trying on and aligning the facing, preparatory for final trying on the stump in the mouth.

The shade of the teeth is secured, and any ordinary facing of approximate size is selected. The pinless facings can be used to best advantage. The groove in the steel facing facilitates concaving, and what is left of it after grinding forms a depression for an important anchorage. The facing is ground the proper length and its rear surface con-

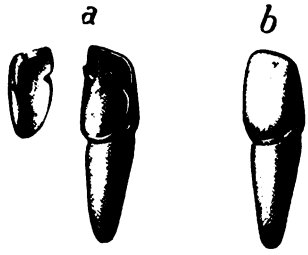


Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.

caved by grinding with clean, smooth stones. The facing should be concaved until it fits snugly onto the labial or buccal surface of the stump in good alignment with contiguous teeth. To attain the best possible anchorage, transverse grooves are cut into the concave surface of the facing with a knife-edge disc. These grooves should be cut at an acute angle to the vertical plane of the facing. The process of concaving and working the facing into a finished product is illustrated in Fig. 2. The facing, A, has been selected with longitudinal groove baked into its body; B illustrates the concaved surface with a portion of the groove left near cutting edge, this portion of the groove serving as an important anchorage; C illustrates the completed facing with two transverse grooves cut into the concaved surface. These grooves may be cut through the mesial and distal walls of facing, which will form lugs in the seat of the completed crown, Fig. 3 A, and appear as gold fillings on the labial or buccal surfaces of facing when cemented into seat, as clearly illustrated in Fig. 3 B. Manufacturers should provide these facings, although the operator may prepare one in ten minutes.

The acute angle of the several grooves worked into the concave surface of the facing, reproducing lugs in the seat at an acute angle to the

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vertical plane of the facing, seats and holds the facing in a substantial manner when cemented and prevents any and all strain on the cement joint.

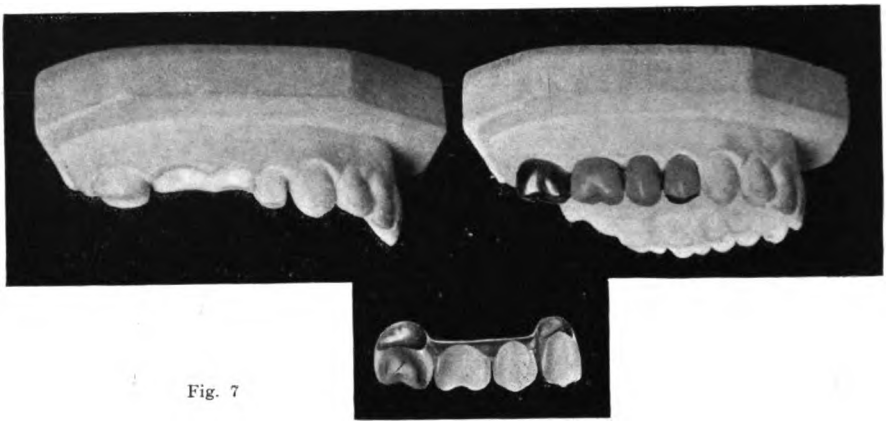


Fig. 7



Fig. 8.

Reverting to the plaster root and stump to be crowned, a strip of pink paraffin and wax is cut long enough to wrap around the plaster stump and lap well on labial or buccal surface. To prevent adhesion the plaster tooth is moistened thoroughly before the wax is applied. The warm wax is worked into a cap over the stump into approximate form, Fig. 1 B. While the wax is warm the prepared facing is moistened to prevent adhesion, and pressed into the labial or buccal aspect of the wax cap and forced snugly into approximate position. In crowning anterior teeth, the wax cap should be molded accordingly; crowning posterior teeth the wax cap should be molded according to the form of

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these teeth. The manufacturers could make assorted wax forms for this purpose.

The wax cap with seated facing is transferred to the reserved plaster cast and tried over plaster stump. Here the cervical margin should be

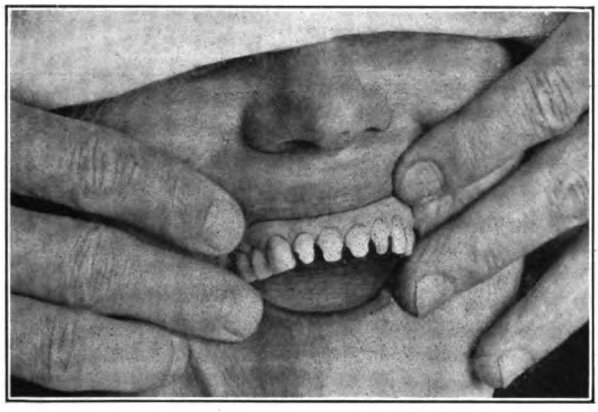


Fig. 9.

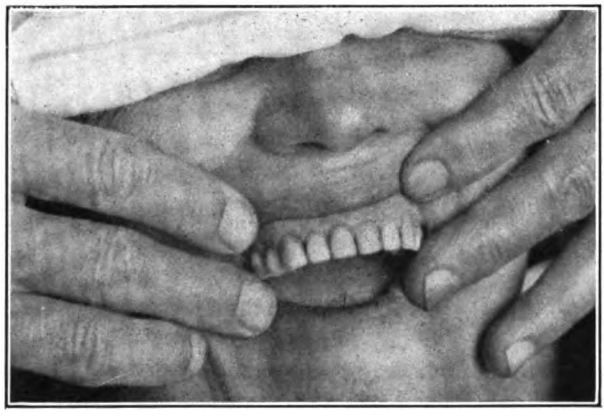


Fig. 10.

carefully trimmed and the facing aligned with contiguous plaster teeth. By appointment, the wax cap with seated facing is transferred to stump in the mouth and subjected to final adjustment, alignment and articulation. Perfect articulation for posterior crowns is obtained by having the patient bite into warmed wax caps several times.

The wax cap is removed from the mouth, the facing is removed from the seat with a sharp-pointed instrument, the cap is invested and a casting made of any suitable metal, preferably of gold. Figs. 4, 5 and 6

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are completed crowns for anterior and posterior teeth. Note the perfect joint with the stump and the facing. A crown may be cast from aluminum and faced with De Trey's synthetic porcelain. Assorted lead forms may be used for impressing the seat into wax forms for this kind of work.

Figs. 7 and 8 illustrate anterior and posterior bridges constructed without injury to the natural crowns. Figs. 9 and 10 illustrate the condition of the teeth before and after applying four incisor crowns two years ago. These crowns to-day are as perfect as when set in the mouth.

Every detail in the construction of this work is precise and mathematically correct. The joint over the stump and the seat for the facing being cast insures absolute accuracy and the highest standard of work. It is important to note that the facings can be re-cemented if unseated. The old pin facings have the disadvantage of breaking away from the backings, and are always badly replaced. One other important feature is the absence of the anchor post, which renders free access to canals in case of need.

The application of these crowns spares the operator all the time and labor of furnace work, courting pleasure instead of dread, as has been the experience of the past.

Zinc Dies Direct from Impressions.

By Mr. E. Scher.
Senior Student, Tufts College Dental School.

I am describing a method of obtaining a zinc or preferably a Babbitt's metal die, when a swaged metal base is required for a denture, direct from the impression. It has been especially useful to me in cases where deep undercuts are present and good cores more or less difficult to procure.

This method may have been employed long before I thought of it and it may possibly have been published, although I have never seen or heard of it. It is entirely original with me and I ask to be forgiven if I infringe upon someone's idea.

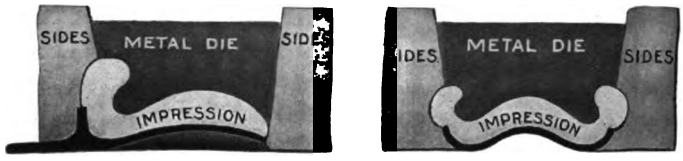
The impression of the mouth for which a metal base is to be swaged is taken in a mixture of plaster of Paris two-thirds, and pumice one-third; instead of pumice any other suitable investment material may be used. If undercuts are present and the impression breaks on removing from the mouth it is best to cement the pieces into place.

If possible the impression is removed from the tray, although it is not necessary to do so.

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Then, using the same material as has been used for taking it, sides are built up from the impression at slightly obtuse angles and high enough to allow for a fairly thick die.

When hard, this is thoroughly dried, and the die metal having been melted, is poured into this mould. When the metal has solidified, and is



cool enough to be handled, the mould and impression are broken away and a perfect metal model is thus obtained, from which a lead or any other counter-die may be procured and the plate swaged as usual. If two dies are needed, two impressions must be taken.

Dental Prosthesis.

By J. P. Ruyl, D.D.S., New York.

Read before the Second District Dental Society of New York, December, 1913.

The oft-repeated remark that the Gysi system is too complicated, that it takes too much time to warrant a small fee of ten, fifteen or even twenty dollars is only too true, but one should get at least twenty-five dollars per plate. This fee might be a little difficult at first until you can show that you are giving and doing something far superior to anything the old method ever produced and the result will be most gratifying to yourself and patients, for you will not be bothered by their returning to have a sixteenth or quarter inch cut off here or there; because this cutting off always entails a chance of not getting at the right place, or of teeth tipping when the patient eats, or of teeth dropping every time he laughs or talks, or of innumerable other complaints that make plate-making so difficult. By the Gysi method you will have an absolute knowledge of what you are doing and why you are doing it.

The average plate turned out to-day is not as good, or is no better, than that of forty or fifty years ago, and when I say not as good, I mean, if any of us were called upon to grind and articulate a full gum-section denture, the mechanical construction would not come up to that of the older practitioners. True this kind of denture is not in use as much as formerly, and if it *were* necessary for a patient, the dentist would be

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very apt to suggest a different one of plain teeth, not because he thought the plain teeth better, but because he knew he could not make the other.

The Wrong Method in Prosthetic Work.

Too much prosthetic work is given to outside men. An office with a good laboratory equipment is an exception to the rule. More often you will find merely a modern bench behind some screen in an operating room. Impressions and bites are taken at the same sitting and given to the mechanical man. Without ever seeing the patient he is told to select teeth for a person twenty-five or seventy-five years old, as the case may be, and set them up for trial. Small wonder is it that we get the results we do and that so many dentists will not undertake prosthetic work at all. I have had occasion to visit a few laboratories and have seen some of the casts that dentists have sent in to be made up; and how they were in any way able to get the finished production into the mouth, or make it stay there long enough for the patient to leave the office, to say nothing of the occlusion, is a wonder to me. And when this work has gone wrong, as it usually does, the mechanical man is expected to do it all over again without extra charge. Not only must these mechanical men be mind readers, but expert mechanics as well, to get any results whatever. I have never been able to figure out, how the small prices charged for plate work originated. All other work, which does not take as long to do, is charged for at a rate out of all proportion to that of prosthetic work. We get much more for our gold inlays than for the hammered gold fillings which take longer to do. and five times as much as for a plate, always I mean in proportion to work done, and yet there is more skill required in the latter, more restoration made, and better results from a standpoint of health for the patient.

The dentist may occasionally turn out a creditable plate, but as he can never be sure of results, he feels very much relieved when one is good. He is never certain when approaching his patient with a new plate that it will stay in place, that the occlusion, size and color will be good, that the plate will balance when in lateral occlusion and that he has properly restored the mouth which he was called upon as an expert to bring back to normal conditions. If by chance and good fortune he has accomplished all this with a full upper and lower he is immediately sorry that he is not getting three times the amount for it, and would have asked for that in the first place if he had known how it would have turned out. That this condition exists will be admitted by most of us, and it is a very sorry plight in which to find ourselves. A little more thought, and a little more time spent at our laboratory benches, if only in the setting up of teeth, leaving the rest to outside men, would improve conditions a great deal.

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Fault not with the Manufacturers.

Manufacturers are often blamed for giving us beautiful shaped teeth, all of one color from which to select, and essayists and speakers who deal with this topic frequently complain that it is impossible to make an artistic selection from their stock. It must be understood that the manufacturer is in business to sell those teeth which will satisfy the largest demand; and those which satisfy that demand are the best for him to produce. The manufacturer would as willingly make a natural-form tooth as a beautiful-looking one, and would not presume to force upon the market that for which there would be no demand. Natural teeth are not uniform in color or shape and yet we ask for a set of fourteen, all symmetrical and beautiful in color, and complain that that is all we can get. In order to standardize their product, the manufacturer must necessarily have some rule for combining the sets; and these combinations are made up by practical men who have learned by experience what densists buy. It was never intended that these combinations of sets would meet with absolute approval of every dentist, but simply to supply the greatest number. Nor is it reasonable to expect teeth to be made in accordance with the innumerable stages of wear and discoloration found in the mouth. Individual cases always require individual effort and any deviations must be made to suit the case in hand. With modern appliances, a dentist can change the shape and color just as nature does, by showing wear and discoloration. This is a question wholly with the dentist and not with the manufacturer. If the bicuspids and molars are out of proportion to the incisors, he can select any other combination needed; I would rather make a full denture from a miscellaneous selection than from any of the usual combinations offered in the depots, and I never think of making a full denture without splitting up at least three sets of teeth, especially for the color effect.

Only a comparatively small minority seems to be aware of the great possibilities of art in prosthetic dentistry, but anyone must see the present deplorable condition of this branch of our work, and all must sincerely desire to have it remedied. With the new anatomical molds and those that will soon be on the market gotten out by Dr. Gysi, we will have ample opportunity of making a fifty years' advance in one stride, and as soon as the public is made familiar with the new order of things, so much sooner will it show its willingness to pay a fee in proportion to the benefits which it will receive. Natural teeth are not uniform in color nor shape. A decided difference exists. Each case rquires individual selection, and dentists who learn this will soon appreciate their efforts, and do away with that stereotyped, even whiteness we so often see. The

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same holds good for straight-pin teeth so often necessary in strengthening lower dentures. If the demand existed the teeth would soon be forthcoming.

Duties of the Profession in Prosthodontia.

Artistic prosthesis is in the hands of the profession, and its advancement depends upon the education of the public. If the profession does not demand what a few idealists think it should demand, the reason lies with the profession. Able men have called the attention of dentists to the necessity of exercising more skill in the construction of dentures, yet few have made any attempt at it. The reason is undoubtedly due to the fact that too much time would be consumed for which they would get poor remuneration. Of course, this could only be remedied by creating a demand for artistic service, a very great obstacle to overcome; for it is not easy to convince an elderly lady who has fully made up her mind that she wants beautiful, regular, white and small teeth, that she needs the direct opposite. But once you can demonstrate your ability to judge for her she will say: "Doctor, I think I will leave it entirely in your hands." Nor should the dentist allow the patient to influence his arrangement of color or size. Patients often have their own ideas on the subject, so much so that a dentist will make changes that he knows to be wrong. He should first consider how to restore the natural appearance of his patient, and this can only be effected through a knowledge of temperamental characteristics. Age and sex will, no doubt, modify the requirements, but the basal fact on which to work is temperament, and non-ability to recognize it will result in failure from an artistic standpoint. Absorption of the process and tissues causes a great change in the face, and a selection and arrangement which will restore the features with all their powers of expression so as to defy detection is one of the most difficult and satisfying adaptations of the dental art. A dentist must familiarize himself with the different characteristics which distinguish one temperament from the other. Charts of this kind have been devised and published in the *American Text-Book of Prosthetic Dentistry,* and by means of these charts it is easy to determine the character of artificial teeth required.

Changes After Extractions.

Following extractions, an upper jaw becomes smaller through the absorption of the external and internal plates, notably the former. Shrinkage is greatest in the breadth, making it necessary to use smaller molars than the originals in order to give play to the tongue. If, for giving fullness to the cheeks, an overbroad selection be made, they will overhang the ridge, causing undue leverage, and will often break the plate. Another change following extraction is the curve of

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the gum-line. In a natural set, with all the teeth in place, the line curves down from the cuspid to the second bicuspid and then up again to the last molar. After extraction the reverse takes place. A line runs up from the cuspid to the second molar, making it necessary to select longer bicuspids and molars than are found in natural dentures. These facts are necessary for consideration in order to make an intelligent selection of porcelain teeth. It does not matter how expert a man may be mechanically if teeth entirely unsuited to a particular case are chosen the denture will be unsatisfactory. The form of tooth required must also be determined; whether the ridge-lap should be long or short; whether the bite be long or short; whether the tooth should be large, small, medium-short, broad or narrow. Each of these things is essential and will do away with many complaints of broken plates and broken teeth, due to faulty occlusion of teeth that were not selected to stand the strain for which they were intended.

Anatomical Articulation.

The success obtained in making an anatomical denture is in proportion to the dentist's ability to record each individual movement of the jaw, and it is only within recent years that such movements could be recorded with any degree of accuracy. Dr. Gysi, together with others, has made this practicable. He has worked out a scientific apparatus which if followed carefully cannot help but give excellent results. While it looks complicated alongside of our old-fashioned plain line articulator, I believe if the technical parts were clearly outlined and all theory eliminated except that necessary for working out the details, a good knowledge could be obtained if one gave it reasonable thought. It is, however, necessary to follow the steps in their order; otherwise inaccuracies will arise to lower the final result. The cost of the apparatus might prevent many from taking up the work, but I am satisfied that the time will come when every man will adopt it or fall behind.

The old methods are wrong and the sooner we let them go the better. The anatomical method is right, logically and scientifically. There should be as much progress in prosthetic work as there is in the other branches of the profession.

Plain Line Articulator.

Unfortunately this seems to be the prevailing articulator used in setting up teeth, and while some of them look well on the articulator, the hinge movement is the only one we can get from it. Of course it has served the purpose for years, for the want of better, but the function of mastication was only partially restored. In the anatomical method the plates are not only balanced when in lateral occlusion, but

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mastication is much easier, for you have, instead of the hinge movement, the lateral movement—the former, merely chopping the food, the latter grinding it.

Upper Impressions. Take an impression cup cut to fit the ridge all around with about 1/16 inch to spare. Cut the cup down so as not to come in contact with the muscles, and have it a little shorter than the end of the hard palate. The cup can be operated with or without the handle, preferably without. Warm the compound and dry the inside of cup, then mold the warm compound into a ball and heat over the flame. Press it to warm cup and mold against the sides, leaving a high cone shape in the center, place the whole mass over the flame, wet the lips with fingers dipped in warm water and press gently to place, endeavoring only to get the roof of the mouth and height of the rim. Hold the cup to place with finger and get the patient to move the lips and cheeks. Massage the cheek against the cup to drive surplus compound down and allow it to cool. Then cut off any surplus that has gone over the heel and trim the sides. Add more compound on one side at a time. Massage, and pull down the cheek muscles with impression in place. Do the same on the other side and add more compound across the heel, and heat over flame. Put it in place, then press with finger against the line of the hard and soft palate and have patient swallow, which act will determine the length of the plate and leave a mark in the compound.

Lower Impressions. Form the lower cup so that the cheeks can be moved and the tongue raised without displacing the cup. Dry the cup and heat the soft compound over the flame and place it in the cup; then heat the outer surface of the compound to a point, just before it runs. Moisten the lips and put it gently to place with the tongue raised. Hold the cup in place with one hand and massage the cheeks. Have the compound go well back on the outer rim so that it can be formed the proper length by the movements of the muscles. Then heat the inner rim one side at a time and have the patient swallow to form the impression there by the actions of the muscles; after this is done to both sides, warm again and allow the patient to form the whole inner surface by pressing against it with the tongue.

Trial Plates. The base plate should be of a material stiff enough to retain its shape when trying it in the mouth. It should be trimmed smooth and carried over the ridge the same as the finished plate. Between the rugæ the model should be carved deeper so that when the base plate is pressed to place it will not rest directly on the rugæ, which is soft, causing the base

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plate to yield. The lower base plate should be shaped to the model in the same manner. Wax is then formed on the ridge of the base plate a little deeper than the length of the teeth should be. A line is then drawn on the cheek with a soft pencil from a point of the external auditory meatus to the lowest point of the wing of the nose. The border of the upper trial-plate should then be trimmed so that it will be on a line parallel to the line previously marked on the face. The other side of the ridge is trimmed in like manner, the eye being sufficient guide to make it level. The upper trial-plate is then returned to the mouth. The border of the lower trial-plate is softened and put into the mouth and the patient directed to close his jaws so that the hardened upper will press the lower into shape. Care should be taken that the trial-plates be so formed as to take the pressure evenly at all parts. Any uneven pressure may tilt it on one side or the other, which would make an unsuccessful finished plate. Mark the median line. (Dr. Ruyl then gave an illustrated lecture describing the anatomical articulation of teeth by Dr. Gysi's method.)

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Compromise Treatments.

By Lloyd S. Lourie, Chicago.
Read before the American Society of Orthodontists at Chicago, 1913.

The American Society of Orthodontists has always been a staunch and ardent advocate of normal occlusion as the basis of orthodontia and as our goal in treatment. If it is to be criticised in this regard, it must be on the score that enthusiasm has caused an apparent disregard for obstacles or limitations.

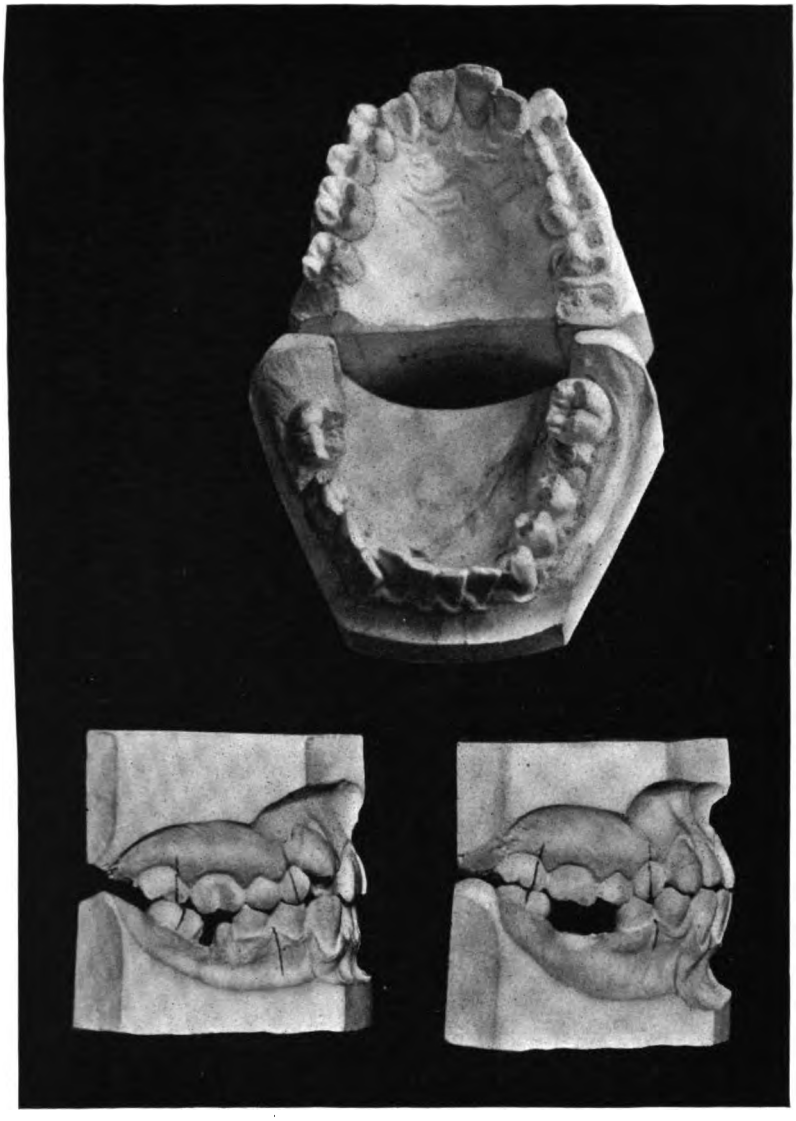
From manifold and continued reports of wonderful results, many have been led to believe that all things are possible in orthodontia. Some orthodontists have even been so radical as to say that only attempts at securing normal occlusion fall within the domain of orthodontia, and that other plans of treatment are inexcusable, and even mal-practice. Several of our members, however, are of the opinion that much harm has been done our specialty, as well as the orthodontist and patient immediately concerned, by attempts at impossible or ill-advised treatment, and at the request of the chairman of the Board of Censors I present for your discussion the following questions, the idea being to develop a general discussion of our limitations.

I. Is it possible in all cases to place and retain all of the teeth in their normal anatomical relations?

II. Even though ultimately possible, is it always advisable to attempt it?

For my part, both must be answered in the negative. When one has satisfactorily treated several cases of extensive malocclusion, he is impressed by the responsiveness or mouldability of the alveolar process

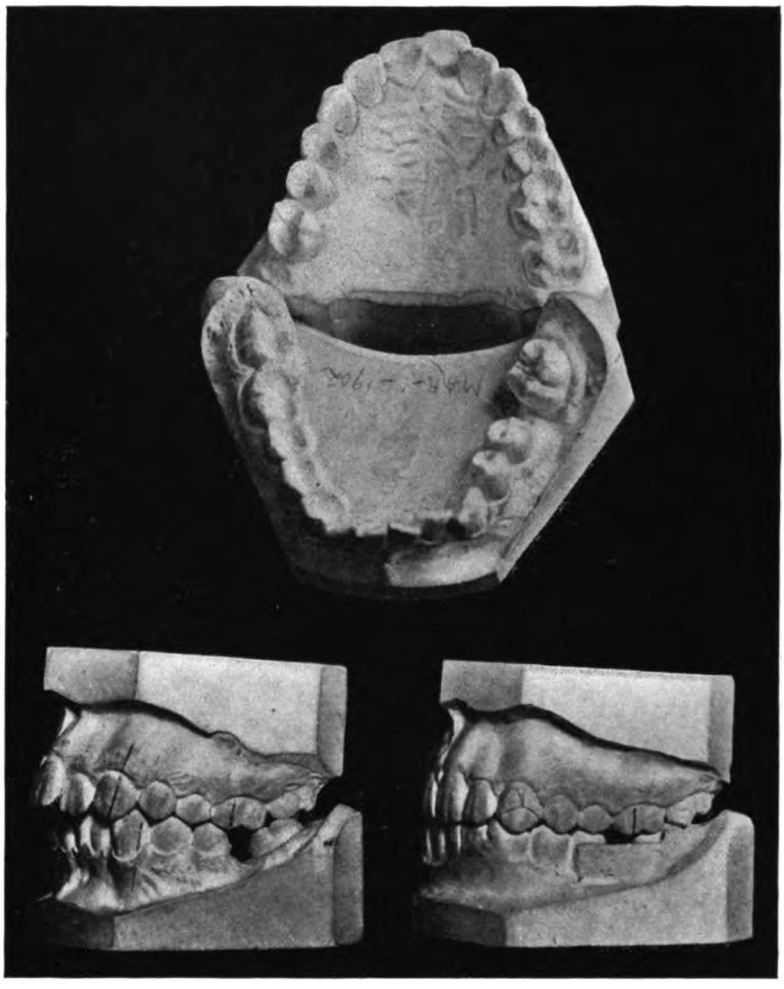
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Case I.

and adjourning parts; and is led to conclude that "it is possible to move the teeth into any position desired." Sooner or later, however, we must all be impressed by the variability of these same structures. Who can say, for instance, that the alveolar process will not be absorbed and fail to be rebuilt, or that the effects of mechanical stimulation will stop at just the desired stage? I must confess my inability to do so, and when

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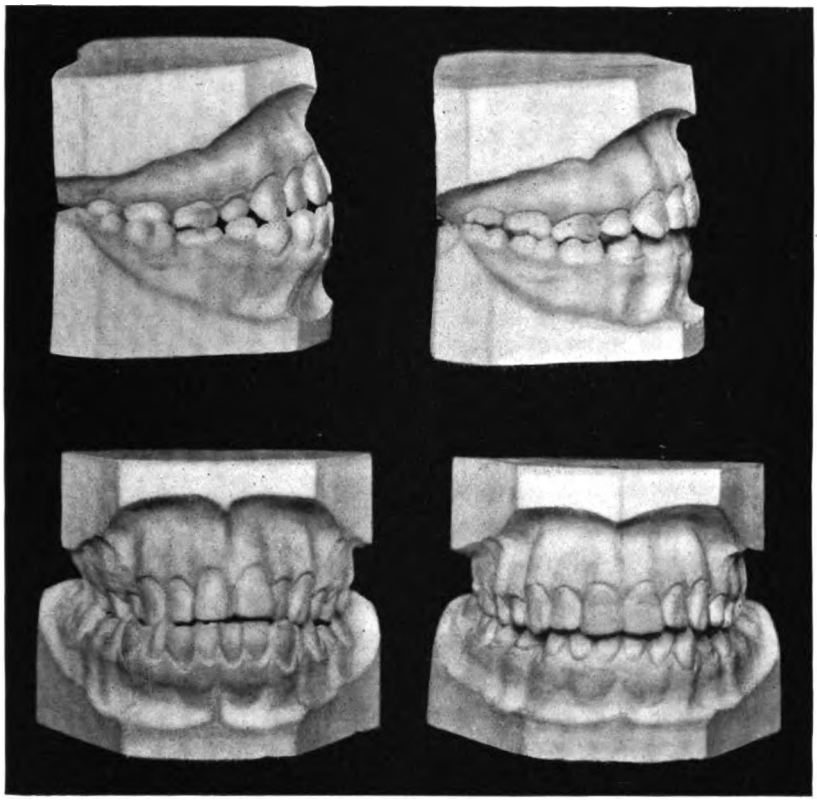
Case II.

confronted by alveolar processes and gums with atrophic tendencies, am willing to arbitrate. Also, I am keeping a "weather eye" open for the effects, on adjoining parts, of overdeveloping or overerupting second and third molars.

Supposing now that we are wise enough and skilled sufficiently to invariably secure normal occlusion with all of its accompanying utility and beauty, are we always justified in doing so? In older patients, par-

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ticularly, may we not be of more practical benefit by sacrificing some of our ideals for expeditiousness and utility? Probably it will be of assistance to consider a few actual cases, occasionally taking the patient's point of view.



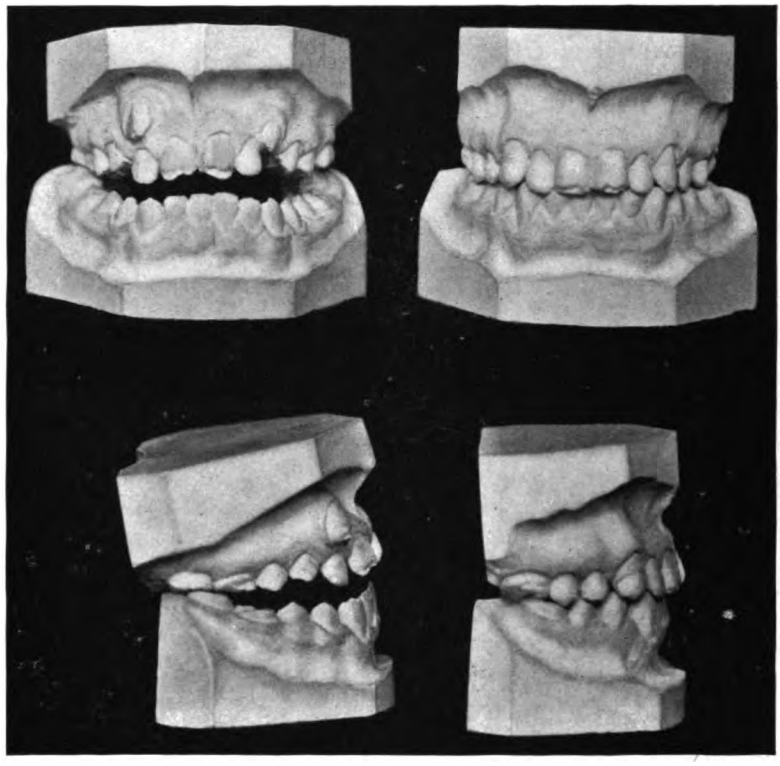
Case III.

The first two were shown to this society at the Philadelphia meeting in 1902, and I was quite proud of them, because of having accomplished something new in the attempts at restoring ideal occlusion. My purpose of moving distally molars and bicuspids to avoid extraction was successfully accomplished, but normal occlusion was not established. In fact, a better occlusion would have been obtained in each case if other treatment had been followed.

Case I. Age 18, young lady, small features, large teeth. Extraction of upper first bicuspids and closure of first molar spaces would have shortened and simpli-

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fied treatment, as well as giving better occlusion and less danger of gum and alveolar process recession. Incisor overlap would have been better and artificial teeth would have been avoided.



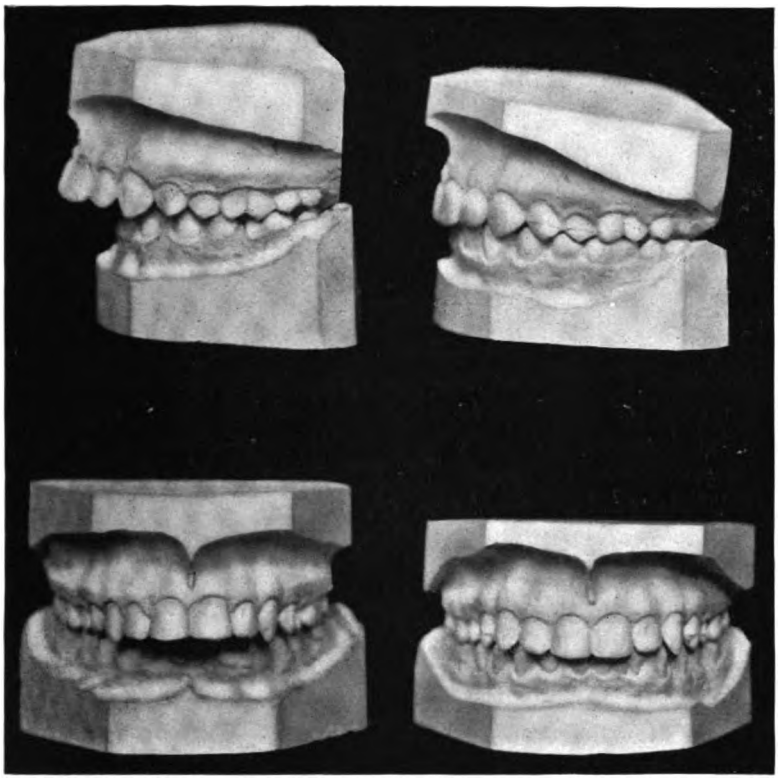
Case IV.

Case II. Age 14, girl. Early loss of upper right first molar and lower left first molar resulted in unbalancing of two arches. Left half of upper arch was moved distally to avoid extraction. Extraction of upper left first bicuspid would have allowed more satisfactory treatment for all parties concerned. Incisor overlap would have been better and a bridge avoided. Retention would have been easier. Opening of the bite in these two cases made lip closure difficult. At the time we had been led to believe that this difficulty would adjust itself with the settling of the teeth into their sockets from use, something I no longer count upon. The thing to do is to avoid opening the bite in treatment, as it will not suffice to

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elevate the anterior teeth, because that makes them more conspicuous and lip closure difficult.

Case III. Age 19, young lady. Previously lost upper first bicuspids and spaces entirely closed, and largely by mesial movement of bicuspids and molars. No incisor overlap. Opening upper arch for first bicuspids would have caused

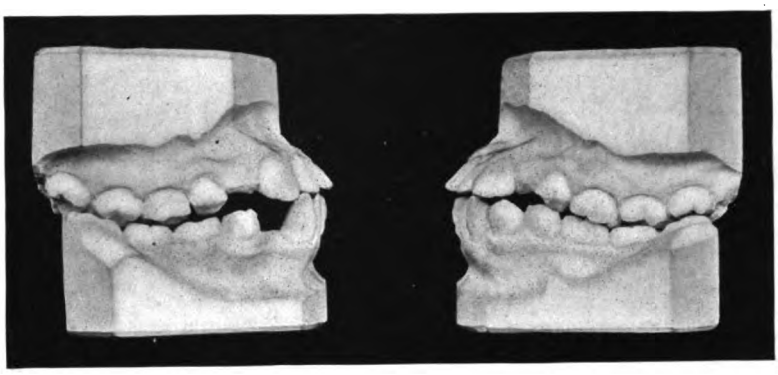


Case V.

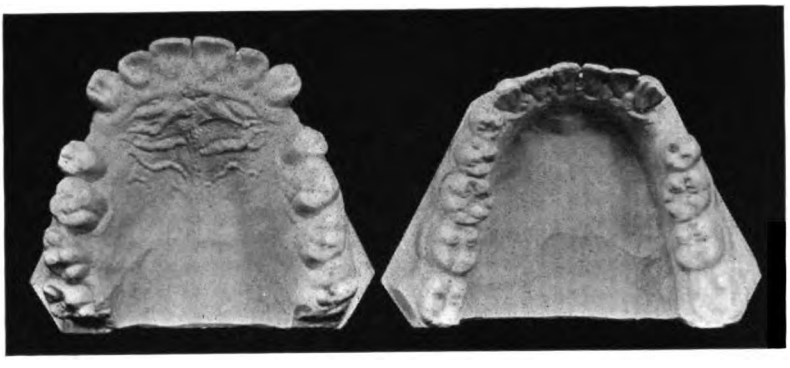
prolonged treatment with doubtful results, especially in closing the open bite condition which probably would have resulted. Extensive disturbances of matured alveolar process might have resulted in permanent injury. All of the above and two bridges were avoided by extraction of lower first bicuspids. This was the first case in which I compromised by extraction, and there never since has been any reason for me to doubt that it was the correct procedure.

Case IV. Age 16, boy. Lack of occlusal contact, excepting second molars, due to excessive eruption of those teeth in lower arch. Treatment without extraction

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Case VI.

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would have necessitated depressing molars in sockets or elevating all anterior teeth into unsightly supra-occlusion, without improving facial lines. Extraction of second molars allowed closure of bite with immediate facial improvement and avoided a protracted treatment with doubtful results. Depression of molars was possible, but not probable, while simply drawing anterior teeth together would have been making an added deformity in attempting to compensate for that in molar region.

Case U. Age 15, girl. Lower first molars previously lost and spaces practically closed, leaving facial effect of retruded mandible. Patient objected to opening lower first molar spaces for bridges. Case treated as though the second lower molars were firsts, with results satisfactory to patient and to me. Of course, it is not normal occlusion, and some grinding of second molars was necessary to allow them to serve in place of the first molars; but I feel that the patient was served better than by an attempt to secure normal occlusion.

Many of those present will doubtless disagree with my decisions in these cases, for difficulties to one may not be such to another. However, the details of treatment are not the subject under discussion, but rather the question of advisability of compromise treatments.

At the present time a consideration of the subject naturally has to do principally with older patients, in whom the most favorable bone-growing period has passed and among whom mutilations or incomplete dentures are so frequently encountered. With the more general acceptance of the doctrines of early treatment and the employment of preventive measures there should be a constant decrease in the conditions under consideration; but I fancy it will be some time before we can eliminate them from our list of troubles.

Discussion on the Paper of Dr. Lourie.

Dr. Wilson Foster. I think this paper of Dr. Lourie's is a very timely one. I know when I first started I attempted to open up the spaces for missing teeth and got into serious trouble. I am very glad now to compromise in many cases. I see no reason why the Society should abandon or change the idea of the basis of orthodontia. Wherever there has been accomplished anything worth while, there must have been some definite or underlying idea toward which to work. In orthodontia this is normal occlusion. In a great many cases we can utilize this idea to the satisfaction of our patients and ourselves. In other cases it is impossible to do so and at the same time benefit our patients as we should be able to do. We should be able to recognize these particular cases when they present for treatment and do the best for the patient, even though we sacrifice some of our ideals.

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Dr. Lourie spoke of the opening of the bite during treatment, which has been a stumbling block for many. I thought it was due to my faulty technic, and if Dr. Lourie or any other member has found a solution of this he would confer a favor by telling us how to avoid it. I have been hoping for much in this direction from the new Angle appliances.

I congratulate Dr. Lourie on the beautiful results he has obtained in Cases 3, 4 and 5.

Dr. C. A. Hawley, Washington, D. C.

I do not wish to prolong this discussion unnecessarily, but there is another phase of compromise treatment which I wish to illustrate.

I am thoroughly satisfied there are cases in which a compromise treatment is necessary, and I am likewise convinced that there are cases in which the extreme effort to obtain normal occlusion does harm. This type of case I have observed in a number of instances, and one case I would like to illustrate (Case 6).

This case was originally treated when the girl was 16 by a general dentist, who extracted the upper first bicuspids and the right lower. If the case had been treated by restoring normal occlusion at that time, it might have been perfectly successful, but the girl received no further treatment at that time. Two years later she went to a neighboring State, and some man, when she was 18 or 19 years of age, attempted to open the spaces for the bicuspids and restore complete normal occlusion. What was the condition at the time? The incisors and cuspids had not closed the space by moving backward, but the molars and second bicuspids had moved forward, and in attempting to restore the spaces for the first bicuspids, the incisors and cuspids were moved far forward of their normal positions and were laid out as nearly horizontal as any teeth I ever saw in a human mouth. The girl was dismissed with the assurance that bone would build up and that the teeth would become upright. I think it is one of the worst deformities I ever saw as the result of treatment. The case was not treated properly in the beginning. The second man did not recognize the real conditions. He went on blindly to restore normal occlusion. A compromise treatment would have produced far better results.

Dr. Dewey. Was he a recognized orthodontist?

Dr. Hawley. He was devoting a good deal of his time to orthodontia.

There is another class of cases that is difficult to discuss without illustration, cases that have passed the period of development. We will agree for a moment that in most cases nature has given the person teeth that will be best suited to the ideal development of the physical body, but for some reason the physical body has been stunted in growth and has reached a mature age. The teeth at this time

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are in malocclusion, and if placed in normal arches and the alveolar process developed, the alveolar process and teeth will be out of all proportion to the rest of the face. I do not like to say this is a general class, but there are such cases. We have a different situation to deal with in restoring normal occlusion of the teeth when patients have passed the age of development. I am unwilling to say that restoration of normal occlusion in these cases is always the best.

Dr. E. H. Pullen, Buffalo, N. Y.

In the introductory portion of his paper, the essayist has referred to this society as "a staunch advocate of normal occlusion and our goal in treatment." With equal candor it may be said that this society is open for conviction to whatever is opposed in theory and practice to this same ideal.

Hence it is that compromise in treatment, or departure from the ideal, will be viewed with the same or even greater interest, especially when presented by such a staunch advocate of normal occlusion as the essayist always has been known to be.

An armless Venus is apparently a departure from the ideal, and to the unobserving may only present deformity in the loss of two probably perfect arms, but to the thoughtful and observing mind the beauty of the figure of this shorn ideal may fully compensate for the lack of arms.

Likewise it may be said that any necessary departure from the ideal of normal occlusion, if viewed from the right standpoint, may present a shorn ideal of great value.

Whether the reason for this departure from the ideal be expeditiousness, utility, or any other of a number of things, the great fact remains that these departures are *very rare exceptions to the rule.*

A compromise treatment of the nature of those shown by the essayist should be, like the crowning of a tooth, the very last resort.

Extraction of teeth in particular is always a contra-indication in the prognosis of cases of malocclusion, and the consequences should be thoroughly and carefully studied before adopting such a measure of relief.

Personally, I have extracted but three teeth in cases of malocclusion in thirteen years, and these were in cases which had been already mutilated by extraction.

On putting the question to most of the members of this society individually, I find that some of you have never extracted teeth, and many of you have about the same percentage of tooth extractions to your credit as myself.

The limitations in the production of normal occlusion can never be adequately described from the experiences of any one man, as no one man's experience is sufficient; neither is his ability nor his perception

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accurate enough to render final judgment without confirmation by his contemporary practitioners. For example, one orthodontist may obtain a result of normal occlusion in a case in which it would be impossible for another less skillful orthodontist to obtain it.

These are personal limitations, however, and should be only taken into account in order to obtain a proper perspective whereby we may see the whole subject clearly.

The essayist, at the request of the Board of Censors, presents the subject of the limitations in the production of normal occlusion in treatment in the form of two questions, the answers to which are expected to reach the heart of the matter.

First: "Is it possible in all cases to place and retain all of the teeth in their anatomical relations?"

Second, "Even though ultimately possible, is it always advisable to attempt it?"

I am sure that every experienced orthodontist would answer both of these questions in the negative, as has the essayist, which does not entirely dispose of the subject under discussion.

A further disposition of the subject which would require the most careful study and differentiation in a symposium of the combined experiences of many orthodontists would answer more vital questions as to the class of cases and the differential diagnosis of cases in which normal occlusion is attainable and those in which it is not, and in cases in which it is advisable to attain it and those in which it is not.

With the present ideal of the orthodontist, treatment under 15 and 16 years of age usually results in normal occlusion and harmonious facial lines.

Beyond this period the individual judgment of the operator should be carefully cultivated through a conscientious study of every involved condition, that compromises should be avoided if possible.

In cases already complicated by extraction and those in which extensive caries of the teeth has taken place, the dividing line between the ideal treatment and the compromise way seem hard to differentiate.

The fewness of the cases shown by the essayist in which he has compromised, as it were, shows that this departure from the ideal is not a serious handicap to the restoration of normal occlusion in his practice, nor is it in any of ours.

A finer interpretation of the results obtained by the essayist might be gained by the study of the faces of these cases, which, unfortunately, he has not shown.

As time goes on, I trust that the members of this society will report cases of similar or unlike nature, so that we may all gain by their frank discussion.

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If fear of criticism of results may deter members from presenting these cases, it should be understood that the consent of the members who report these cases to have their reports published should be first obtained.

There can be no question of Dr. Lourie's ability and judgment, and if in his practice his results seemed expedient, or of greater utility, or the lip closure seemed better, I am not willing to be the one to call him to any critical account, although I am not certain that my plan of treatment would have been the same.

The President. Dr. Lourie's paper is now open for general discussion.

Dr. R. Ottolengui, New York. I think a paper that brings before us the question of our limitations is equally as important as one which brings before us the question of our possibilities.

I would like permission to talk on this subject from an entirely different angle. The cases discussed are somewhat later in life than those I wish to discuss, and they deal with mutilation. We have a large problem confronting us when we have to deal with the young mouth in which a tooth or teeth are congenitally absent. It seems to me the time has come when we must cease to be hide-bound in our dogmas. To explain more fully what I mean, let me say that the general tendency at the present time is to insist upon a definite number of teeth in every mouth. The natural teeth must be placed where they belong, regardless of the congenital absence of other teeth. I think the sooner we get away from that idea the more quickly will we be making progress in treating these cases as a separate class. Some one not long ago said that the bridgeworkers would soon develop a technic which would be a satisfactory solution of the problems which we leave for them to solve, when we follow our religious tenet and move all the teeth into proper places and leave spaces for the bridgeworkers to fill. Thus far they have not done so. I want to say two things along this line.

First, is it restoration of normal occlusion to place teeth in normal physiognomic and physiologic line one to the other, but with spaces between them, without the natural intervening organs which are needed to keep them in those positions? Or supposing that these spaces can be filled, are we to restore normal occlusion with the assistance of the prosthetic worker, when to do so we must compel two tooth roots to do the work of three in carrying a bridge? It seems to me that in addition to the actual position of the teeth we must remember the physiologic functions which they perform. We should recognize the fact that in youth one live tooth is worth two dead ones or pulpless ones. We should

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recognize the fact that teeth operating in the arch as units serve better than two individual teeth bound together to do the service of three.

One problem which the prosthetic men are studying, but have not yet been able to accomplish, is the construction of bridgework in which the teeth move as units and which does not put stress upon the adjacent teeth.

Dr. Fred'k C. Kemple, New York City.

A serious problem that confronts us more often than extracting is what to do when one or two teeth are congenitally absent or have been lost. Shall space be made where these teeth are missing and artificial substitutes inserted? How shall these be attached? By partial plate, fixed or removable bridgework? How? It is a difficult question and has not yet been satisfactorily answered.

In the large majority of cases where only one or two teeth are missing (not adjacent) I believe it is preferable to close the space, if possible, by moving the teeth together, rather than resort to the unsatisfactory expedient of any kind of artificial teeth at such an early age. It is a serious matter to mutilate young teeth for bridge attachments of whatever kind, and a partial plate must be a constant source of annoyance to the patient and jeopardy to the natural teeth and soft tissues of the mouth.

Where several adjacent teeth are missing artificial substitutes must be used; they are our *last resort* and should ever remain so. In such mutilated cases an ideal result from treatment is impossible. Artificial substitutes are a compromise; closing the spaces is a compromise; but I believe the latter, in most cases, is the lesser of the two evils. I would make exceptions of those cases that require a normally large arch to aid in normal breathing.

This is the first time, I believe, in the history of this society that the question of the advisability of sometimes extracting in order to facilitate treatment or secure retention has been discussed. This is the thirteenth annual meeting—thirteen years without feeling the necessity of discussing the question of extracting in the treatment of malocclusion is a splendid record for this society. If this has been an error, and I believe it has not, it is certainly erring on the side of safety—on the side of conservatism.

All of us, I presume, have adopted the rule, "Never extract," and in my opinion it is a safe rule to follow. There will come into the average practice in orthodontia very few cases in which it would be wise to deviate from this rule, and these few cases would probably be confined to patients past sixteen or seventeen years of age. In my own practice, in order to facilitate treatment, I have extracted only one tooth for a young patient, and then my judgment was wrong; the tooth should not have been extracted; the result would have been better if it had been kept.

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But there are exceptions to every rule, and it is these rare exceptions that Dr. Lourie is discussing in his essay. I have seen a few of the cases to which he has referred in his paper, and I must agree with him to this extent; probably more satisfactory and pleasing results could have been obtained in these cases, and both treatment and retention simplified by the judicious extraction of one or two teeth.

I have seen one or two cases where extraction had been resorted to with gratifying effect. One of these came to my attention soon after I returned from Dr. Angle's school in 1900. A young lady, attractive in appearance and with pleasing facial lines, with beautiful teeth in good alignment and in good occlusal contact, had the two upper first bicuspids missing. I was surprised to see this; it rather shook my faith in the "law," but I realized that such conditions are very rare. On inquiry, this lady told me that her "teeth had been very irregular and prominent when she was a child, and that her dentist had extracted these two bicuspids when he straightened them."

In order to maintain retention of some cases it may be necessary to consider extraction of lower third molars more often than any other extraction, but these cases are also rare. I would still maintain the rule, "Never extract," and would emphasize the fact that *only in rare and exceptional cases is extraction indicated.*

Dr. C. L. Grisamore. Chicago.

I would like to take this opportunity to congratulate Dr. Lourie upon his paper. A man who comes before this society and reads a paper of this kind and shows where he has made a failure is one who deserves great credit.

It is seldom that a case comes to us where it is necessary to extract a tooth or teeth, but I do think we get such cases occasionally. It is an entirely different proposition to take a young individual who comes under our care, six or seven years of age, and give the treatment the patient should have to develop normal arches. That is all that can be done; but what are we to do with the older patients, those who are 18, 20 or 25, and we do get them? We have to deal with them, and they want results. In some of these cases this can best be done by wise extraction. Sometimes I hesitate before I extract a tooth or before I would advise another dentist to do so, because I always feel if you advise a man to take out a tooth in a case he will do it, and then next week, when another case presents, he thinks it is similar and that the same treatment should be followed, although the case may be entirely different.

Dr. Martin Dewey, Kansas City, Missouri.

Several years ago Dr. Angle promulgated the doctrine that the best balance, the best harmony, would be obtained by having the full complement of

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teeth. I still believe it. After seeing Dr. Lourie's slides, I believe it more than I did before. I believe it because it is a question of judgment on the part of the individual orthodontist who sees these cases.

The first case he showed was treated several years ago, where he opened the space for the first molar. He said the overbite was too short. I would like to know how he knew it was too short; he would simply answer because of his judgment, probably. The length of the overbite of the anterior teeth, as I said yesterday, as proven by comparative dental anatomy, depends upon the length of the cusps. The case shown had a short cusp of the molar and should have a short overbite. In other cases he treated and showed the overbite was too great. That is not my judgment, but is a rule based on comparative dental anatomy. The loss of the first molar or any tooth has a tendency to produce an excessive overbite, and there are more pathological conditions being treated to-day, more cases of pyorrhea caused by excessive overbites than by short bites. Those of us who are so situated as to observe cases of pyorrhea, and have seen a variety of them, must have been impressed by the large number of instances in which the principal etiological factor was an excessive overbite. Where one bicuspid had been extracted, and Dr. Lourie took out another, the overbite was too great. In a few years he will have the lower incisors striking against the upper gum. That will cause more trouble in treating these cases and eventually putting in artificial teeth.

Where teeth are congenitally absent, as described by Dr. Ottolengui, another phase of the subject is opened up. We must be careful, and I think Dr. Lourie has erred because of the rule such I have laid down in producing the overbite in this case.

He speaks of another phase of the question—mature alveolar process. I do not know what he means. He intimates that the alveolar process or the osseous system stops growing; that it never changes. There is no such thing, because the alveolar process and osseous system are constantly changing, and they keep changing as long as we live, and what he means by mature alveolar process is something which I do not understand. I still contend that the greatest balance or the best result for the individual is obtained with the full complement of teeth, and advocating compromise treatments, obtaining results which are entirely out of keeping with anatomy of the parts involved is wrong.

Dr. M. H. Federspiel, Milwaukee.

I wish to say that compromise treatments are practiced in every phase of medicine. We compromise treatment in diabetes, in nephritis, and in general surgery. It is not always possible to produce ideal results in the practice of orthodontics, therefore we are called upon

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many times to obtain an improved condition. I wish to congratulate Dr. Lourie on the position he is taking. He is working along correct lines.

Dr. J. Lowe Young, New York City.

I am very glad to have had the opportunity of listening to Dr. Lourie's paper, but to take issue with him without a careful study of the models and photos of each case I believe would be foolish. I am convinced that the essayist would be one of the last men in this society to resort to compromise treatment without careful study, probably extending over months, of models and photos of the case, and that when he decided on compromise treatment it was owing to the fact that he considered it the best course for the patient.

There is no doubt we have our limitations in this work, and the older the patient the more certain we are to encounter these limitations. After patients have passed the period of normal bone growth surrounding the teeth, we have to a very large degree reached limitations. I wish to repeat once more, I am convinced that to be successful we must resort to early treatment, or, still better, preventive treatment where possible.

In ten years I have advised the extraction of but one tooth, and that was for a patient nineteen years old, who had one upper lateral absent and the other lateral very small, or what is known as a peg tooth. In this case one lower first bicuspid was removed, and I am convinced, as the models will show, that it was the best course for this patient.

Dr. Guy G. Hume, Toronto.

I would like to ask Dr. Lourie a question. I think in Case No. 3 he has certain characteristic facial features of Class 3, if I understood him. Would it have been practical, or did you think of treating the condition and establishing the mesial relations of the upper molars to the lowers. The reason I ask the question is that at the present time I have under my care a case that was started in that way, and I am continuing the treatment. There is a very marked inclination of the upper central incisors, and I was doubtful at the time when I saw the case whether it was practical or not. This young lady was seventeen years of age. She originally came to me and I diagnosed the case and believed the best treatment was to open the spaces for the first bicuspids. She went abroad, and during that time I communicated with the dentist across the water, and he thought from the standpoint of treatment I was wrong, and that he would treat the case as a Class 2 case, establishing that relation, that is, a mesial relation of the upper molars to the lowers. When she returned I continued treatment, and I am still working on it. From that standpoint I would like to have Dr. Lourie answer the question.

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Dr. Lourie. I would not have considered it in this case at all, because in my method of shifting the mesio-distal relation of these teeth I would have caused consideral opening of the bite, and that was one of the difficulties I wanted to avoid, because I find it requires long treatment to get satisfactory results in closing the bite in these conditions.

Dr. Dewey spoke about the length of the overbite being proportionate to the length of the molar's cusps. I am familiar with that theory, and think, as a general proposition, it is correct. It will not hold entirely, for there is not enough variation in cusp length to account for the variations in length of the overbite.

Instead of considering the length of the molar cusps, I would much rather decide what the overbite should be by considering the size and shape of incisors. I feel there is usually a definite place for upper incisors to receive the occlusal contact of the lower incisors. This is not scientifically accurate, but clinical experience will confirm it.

Dr. Dewey says he does not know what I meant by using the expression mature alveolar process. The term mature alveolar process is probably inaccurate, and I will admit that the alveolar process is never mature in the sense that it stops growing; but I have always understood that in early life the alveolar process is a more cancellous structure and the cortical plate not so dense as in older patients. When I spoke of mature alveolar process I meant an alveolar process that has the characteristics found in older patients, an apparently dense cortical plate, and very little cancellous structure, and in many cases practically nothing but a cortical layer.

I am glad the subject of teeth that are congenitally absent was brought up. There are many things that enter into the consideration of compromise treatment that I did not mention. It is not simply a question of whether we should extract teeth or not, and I hope it will not be thought that we are receding from our ideals with reference to the general proposition of extraction. We must all recognize the necessity of extraction in some cases, because we realize our limitations.

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Amalgam and Its Phases.

By W. G. Crandall, D.D.S., Spencer, Iowa.

Read before the Union Meeting of the Third and Fourth District Dental Societies at Schenectady, N. Y., October, 1913.

The first purpose of this paper will be to make as plain as possible to you a few of the important facts regarding the use of amalgam, and to make these facts so plain that they will be of service to you, and of ultimate benefit to your patients. The second purpose will be to draw out a discussion of the subject that will cover every point in doubt in your minds as to the usefulness of this important material which we are considering. By this statement it is not the desire of your essayist to infer that he has a universal knowledge of the subject; he very readily admits that this material contains many mysteries and laws governing its physical and chemical actions of which he is in the dark.

Amalgam—so simple in composition, and in so universal use by our profession for so mnay years; certainly, there remains nothing unsolved regarding amalgam or its use. Would that this were true. Many of our best men have given freely of their minds, that we might be the better equipped to serve our fellow-men with this material, and the results of their labors have borne fruit. One step after another amalgam has been developed so that it stands to-day the most used, as well as the most abused filling material in our hands. A careful review of the voluminous literature of the subject is sufficient to convince one, that it is quite hopeless to record many new observations, to develop any new properties in the material, or to expand extensively upon their uses. In

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fact, the subject seems to have been covered, that is, if one were only to consider the printed records, he would be overcome with the exhausted condition of the subject.

Causes of Failure with Amalgam.

However, let us for the moment forget the printed records, let us be more practical and do the common sense act of searching out our failures. No need to ask the question, for we all know and most of us will admit that amalgam fillings do fail; even our own fillings occasionally will fail. Why? Yes, why? That sounds as though it would require mental effort to solve, so let us make it easier and ask, "How do they fail?" Perhaps we can get part way up to that one; let us try! After carefully studying the subject, I am of the opinion that the following are among the chief causes of amalgam failures, any of which might lead to fatal results.

1. Poor cavity preparation.
2. Lack of adaptation and condensation of the amalgam.
3. Careless methods of operating.
4. The use of unbalanced alloys.
5. Because of flow and fracture.
6. Because of unfinished margins and surfaces.
7. Faulty amalgamation.

These various causes I have attempted to give in the order of their importance, and for convenience in discussion. With a clinical knowledge of some of the causes of our failures with amalgam, let us examine a few of these briefly, that we may possibly correct or alter our technique for the better.

Cavity Preparation for Amalgam.

I have mentioned as the first and greatest cause of failure the cavity preparation. In my mind there is only one other cause of failure that approaches it and that is poor adaptation. The subject of cavity preparation is so vast in its importance, that it must of necessity be considered in a different paper. We will but briefly mention here in a general way its importance. Dr. Black has given us such a perfect system, and you no doubt are so familiar with it that I could add but little. The system is not new, it is now time-tried and has been found not wanting. It has been preached and demonstrated the land over, time without number. It has been your essayist's privilege to have an intimate acquaintance with a large number of men, who have mastered the technique of this system, and who practice it continually, and I must say to you that I know of no man who has mastered the technique, who will so much as suggest a fault, or who has been willing to give it up even partially for any other system. All must

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admit that fillings well made in cavities of this type are remarkably long-lived. Yet, if we were to go upon the streets of any of our cities to-day, and had the privilege of a close examination of the first one thousand amalgam fillings that passed us, would we find one per cent. of that number with margins properly extended and beveled, with a flat seat and parallel walls and with proper occlusion? I think not, but why I cannot tell you, except that *too many of us are so busy earning money, that we are unable to honestly practice our profession.*

To have a large percentage of success with our amalgam fillings, the cavity must have such an outline form that its margins will lie in areas of comparative immunity. For resistance to the forces of occlusion, the base or seat must be flat and at right angles to the long axis of the tooth. More retention is needed than for gold because of the fact that amalgam cannot be wedged between the walls as is gold foil, and, further, it lacks strength and tends to flow from the cavity, therefore, the cavity should be slightly retentive in form, carefully avoiding undercuts of depth which might in any way weaken the walls.

In approximal cavities where the occlusion is normal, it is well to give as great a breadth and depth to the step as safety to the pulp and the marginal contour will permit.

The prevailing opinion seems to be that margins of enamel should not be beveled for amalgam, that is, that the cavo-surface angle should be at right angles. This is a dangerous doctrine. The margins must be beveled so that all unsupported enamel rods will be removed. If they are not removed during the preparation, they will become detached later on and leave a defect in the margin. Dr. Black's rule is that the enamel should be beveled one-fourth of its depth. This would be proper for gold foil, but for amalgam it would leave a thin edge that would not be strong, therefore, we make our bevel the entire depth of the enamel or even deeper. The chisel should plane the entire enamel surface, following the direction of the enamel rods, with just enough angle from the cavity to safely include all unsupported rods. This form of cavity gives as nearly as possible a right angle form to the surface margins of the amalgam.

Whenever there is doubt of the strength of any wall or cusp, the permanence of the operation demands its removal. The rule is that no metallic filling should ever be placed against an enamel wall unsupported by sound dentine. For esthetic reasons, the rule may at times be disregarded. However, with amalgam placed as it usually is placed in the posterior teeth, the rule should be followed very closely. If the destruction of the dentine has become so great as to endanger the strength of any cusp or wall in the bicuspid or molar teeth, I should advocate the

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cutting down of such a wall or cusp to such an extent as to permit of restoring it with a bulk of amalgam, that will have great enough body, so that its strength will have a safety margin to stand any force of occlusion. In cutting down such walls, it is wise to cut them very boldly, usually about two-thirds of the gingivo-occlusal diameter of the tooth. Once the summit of the cusp has been destroyed, there is nothing to be gained by conserving such a wall, and the permanence of the operation demands a large bulk of amalgam to insure against fracture or flow.

These few suggestions as to change in the regular rules of cavity preparation are made necessary because of the difference in the physical character of the filling material. Amalgam becomes strong as the bulk increases, therefore, the necessity of placing a larger mass where stress will come. Its margins are not ductile, therefore thin margins should be avoided.

Adaptation and Condensation.

More amalgam fillings fail because of poor adaptation than from poor alloy. The assertion has often been made that it requires greater skill to make a good amalgam filling than one of gold. This lack of skill is shown in the use of both materials by poor condensation and adaptation. We all know that to be of service the filling material must be in close adaptation to the walls. Our only difference of opinion can be, "how will we place it there?"

Dr. Black has demonstrated that amalgam fillings contain about fourteen per cent. of air-space, often much more. The air becomes incorporated in the amalgam during the process of mixing and placing of the filling. It remains in the filling because compression has not been sufficient to force it out.

To get good adaptation we must have heavy condensation and with the proper lines of force. We cannot get heavy condensation without strong walls to work against; a matrix when in place is considered one of the walls of the cavity. Experiments and experience have proven to me that heavy mallet force, using flat-faced serrated instruments, will produce the best adaptation and the strongest filling. The instruments best adapted to the purpose are those that most nearly fit the cavity. (Illustrates pluggers.) The plugger must not be so large that it cannot be readily manipulated in the cavity, or that there will be danger of wedging between walls and producing fracture, but sufficiently large to carry the amalgam to place, and hold it under stress. Small pluggers chop the amalgam and disturb that which may be properly placed.

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Amalgam is treacherous in that it packs and adapts on the surface, readily giving the appearance of thorough adaptation. If we should place on the floor of the cavity a small roll of amalgam, and bring pressure upon it with our flat-faced plugger, we condense it only beneath the plugger. It will spread from beneath the plugger in the lines of least resistance, but will not condense into the angles of the cavity until the plugger comes directly over it. Therefore, the amalgam should be condensed from the center to the margins, stepping the pluggers in about the same angle as for gold, always producing the last pressure at the margins. In making large restorations, you may have noticed after having packed one side of the filling, that pressure upon the extreme opposite side would show a change in color and form of the surface, radiating from the side where pressure is brought to the opposite side. If pressure with the plugger upon one side of the filling will produce movement upon the opposite side of the filling, which is visible to the human eye, how are we to obtain a tight filling? My answer is, that within the cavity the amalgam must be forced from the center to the walls and angles, using pluggers as large as the cavity will permit. In completing the filling, a large excess should be built on and a plugger used that will cover the entire cavity and margins. When heavy force is brought on this, the amalgam will be forced directly against every margin and not away from any.

When this is complete, the filling should not be touched until crystallization has set in so that plasticity has passed and the amalgam can be carved. The cutting and finishing should then be done so that the force is all directed toward the margins. At this time the filling should receive only a rough finish, that is, all large excesses should be removed, and the approximate contour obtained, so that the final finish, when the amalgam is thoroughly hard, will not require much work. The patient should be instructed that the operation is not yet completed and that another sitting will be necessary.

Careless Methods. Our third cause of failures is evidenced by its results. The way some dentists operate might be compared to a surgeon making a laparotomy operation without first making a diagnosis. He does not know what he has started out to do, and, of course, does not know how he will do it. A careful operator after examining a cavity should study the occlusion, know the lines of force and prevailing conditions, and plan his operation to resist them. He should lay his margins in areas that will be swept and cleansed by the food in its excursions over the tooth. Remove any weakened cusp or wall and support it with a mass of filling that will be amply strong.

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Use of Rubber Dam.

Before the preparation and toilet of the cavity are complete, the rubber dam should be adjusted, or some other means provided that will keep the cavity absolutely dry. I believe thoroughly in the use of the dam, and use it whenever it can be used with the exception occasionally of very small pits, that I know do not have carious tissue at their base, and whose margings are simple to prepare and the time to be consumed short. I use the dam because it clears the field and gives better vision, and excludes all moisture and infection from the cavity. The amalgam should be packed against walls and margins that have not been coated with saliva, for wherever the saliva is dried, it leaves its coating of dried salts and débris, and such a coating is not safe on a margin. Moisture should absolutely be kept away from amalgam while it is being manipulated; it will weaken any amalgam, and the maximum strength of amalgam is none too great. The rubber dam is a time-saver for the skilled operator. When it is once in place, the operator can give his entire attention to the operation without fear of the cavity becoming suddenly moistened by some erratic action of the patient.

One of our best-known operators has kept account of the time required to adjust the rubber dam for a period of time. The average for all cases was about two minutes. Perhaps the patients do not appreciate it, but if we are working for their interest we should use our own judgment.

Use of Matrices.

This question has actually been put to me a number of times by men who looked bright and intelligent, "Do you believe in the use of the matrix?" Do I believe in the use of the matrix on approximal cavities? I believe of all careless things done in careless moments by careless men, the making of an amalgam filling in an approximal cavity without a matrix is the most careless. A man who would do such a thing is not a dentist. It is only by hiding his work in the septal space behind some dumb molar in a dark corner of the mouth of some innocent and unsuspecting individual that he is permitted his freedom.

We speak of educating the public in oral hygiene—splendid thing, but it might be well to take some action toward the education of our profession first. A good amalgam filling upon the approximal surfaces is not possible without a strong and properly adapted matrix.

(To be continued)

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A Statement to the Profession.

From the American Academy of Oral Prophylaxis and Periodontology.

Believing that the interests of all concerned demanded the formation of a society devoted to the advancement of oral prophylaxis and the study of so-called pyorrhea alveolaris, a committee, whose names appear below, met in Cleveland, Ohio, February 21, 1914, and adopted the following resolutions:

Whereas, The progress recently made in the prevention of dental caries and the prevention and cure of so-called pyorrhea alveolaris has reached a point where definite and favorable results are known to be attainable; and these results are of great benefit and importance to the public; and

Whereas, The failure successfully to combat these lesions for many years past has rendered the general dental profession skeptical as to the results attainable by methods now being advocated; and

Whereas, Experience has shown that the necessary skill in diagnosis and treatment of periodontal disease may best be acquired by the specialist; and

Whereas, The existing dental societies do not afford to dental practitioners a sufficient opportunity for the free interchange of ideas whereby the science and art of these branches may best be advanced.

We, the undersigned, do hereby deem it for the best interests of the public and the profession that a society should be formed, to the end that those especially interested may meet and work together without prejudice for the scientific investigation of periodontoclasia and caries, and that the practice of oral prophylaxis and periodontia as an exclusive specialty may be encouraged; and that the general profession may be made fully acquainted with the results that can now be obtained. We furthermore declare our intention of forming such a society, at a meeting to be held at Cleveland, May 23, 1914.

(Signed) J. O. McCall, Buffalo, N. Y., Chairman.
Grace Rogers Spalding, Detroit, Mich.
G. M. Gearhart, Washington, D. C.
Gillette Hayden, Columbus, Ohio.
J. W. Jungman, Cleveland, Ohio.
J. H. Hood, Cleveland, Ohio.
A. C. Hamm, Denver, Col.
Committee of organization.

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In accordance with the above resolution, a meeting was held in Cleveland, May 23, 1914, at which was organized the American Academy of Oral Prophylaxis and Periodontology.

At this meeting, Dr. J. O. McCall, chairman pro tem., set forth the reasons for forming such an organization and its objects, in a more extended manner, in an address from which the following extracts are taken:

Address by Dr. J. O. McCall.

While our specialty is conceded to be the most important branch of dentistry in so far as the health of the mouth and its relation to the health of the body is concerned, we yet find ourselves in a somewhat anomalous position in our profession. The situation is as follows: as follows:

Individuals who have spent sufficient time in study and the development of a special technique, have demonstrated in their own practices the success of preventive and curative measures as applied to the tissues of the mouth, and have also shown the beneficial effects of these measures on the health of the body. The methods followed and the results obtained have been published to the profession, discussed, and in a general way endorsed; but there, for the bulk of the profession, the matter has stopped. Why? For several reasons.

The general practitioner has been confused by the differences in methods advocated, not realizing that all methods are fundamentally alike.

Because of the special technique involved and because results cannot often be obtained or shown at the same sitting, our clinics mean very little to the majority of observers. Consequently, our assertions as to the results of our work and our recommendations relative to it carry so little weight that we are virtually discredited and our specialty is in danger of being relegated to a position of secondary importance by the consideration given to the mechanical procedures which have been at once the glory and the bane of American dentistry.

Scientific research has so far done comparatively little to lift our work from the plane of empiricism, and we furthermore have no terminology worthy of the name.

The general practitioner who has made an effort to follow our recommendations has bought a few scalers and stocked his medicine cabinet with an array of drugs. He has then made an effort to develop in a day the diagnostic and technical ability which it has taken us years to attain; has then fallen back upon the application of one medicament after another, finally attributing his failure to the intractable nature of

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the diseases encountered, rather than to the lack of proper training and equipment.

Furthermore, he has not always recognized cases in their incipient stages, when he could either apply preventive treatment, or, failing in that, refer them to the specialist at the time when the best results could be attained.

Pyorrheal cases, when sufficienly advanced to force themselves on the attention of both the patient and the operator, are treated in a faithful but unavailing manner by the general practitioner, who, in the absence of a well-established and recognized specialty, hesitates to confess to the patient that he cannot cope with the disease. The result here is, the patient loses his teeth and may have his health impaired, or is referred to the specialist when curative measures can no longer be employed with reasonable hope for success, or are perhaps inadvisable.

Where specialists have established themselves, there is a feeling of doubt on the part of the general practitioner as to just what to expect of the specialist. Will his fillings and crowns be criticised? Will the specialist order them removed and new ones placed, thus undermining the patient's confidence in the family dentist? On the other hand, will the rough edges, faulty occlusal restorations, the half-hearted co-operation of the referring dentist make success impossible to the specialist?

The basic objects of such a society, then, may be briefly stated as follows:

To establish for the benefit of the profession and the public the need and value of the services of the specialist; the need of early identification, diagnosis and treatment of periodontal disorders, and to publish these facts to the profession and through it to the public.

To determine the field of the specialist.

To classify periodontal disorders in a scientific manner so as to permit of proper diagnosis and prognosis.

To adopt and recommend to the profession a nomenclature based on a proper classification, which shall be sufficiently accurate and in accord with scientific findings to merit universal indorsement.

To crystallize and unify as far as possible methods of treatment, so as to focus attention on essentials and avoid confusion over non-essentials; and, finally,

To carry on, or cause to be carried on, scientific research to determine the nature of the disease processes in the mouth, their etiology, diagnosis and relationship to bodily disorder.

The academy was organized with a charter membership of eighteen. The membership will be active—those dentists whose practices are de-

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voted to oral prophylaxis and periodontia—and honorary, those who have notably contributed to the advancement of knowledge in this special field. Membership will be by invitation only.

The following officers were elected:

President—Austin F. James, Chicago.

First Vice-President—Andrew J. McDonagh, Toronto.

Second Vice-President—R. G. Hutchinson, Jr., New York.

Secretary—Charles P. Wood, Detroit.

Treasurer—Mary E. Alleyne, Detroit.

Council—Grace Rogers Spalding, Gillette Hayden, Clyde M. Gearhart, J. W. Jungman, J. Herbert Hood, and John Oppie McCall.



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Teaching the Technique of Carving Gold Inlays.

The papers to be read before the approaching International Dental Congress are divided into volunteer essays and reports. The reporters have their subjects assigned to them, and are expected to give an account of "the state of the art" in their home countries, rather than an exposition of their individual views.

The writer had the honor to be nominated by the American Committee to write a report on "The Filling of Teeth with Cast Gold Inlays." Believing that it would be of interest to learn something of the teaching in the schools, as might be judged by the work of the undergraduate body, he sent a communication to all the Deans of American Colleges, asking that the students be requested to make specimen gold inlays for exhibition at the Congress, and offering a gold medal for the best inlay received.

This little friendly contest thus inaugurated in the schools has resulted in several surprises. A time limit for the reception of these inlays was mentioned in the original letter, and on the specified date only a single inlay had been received. This seemed to indicate a marvelous desire on the part of teachers and demonstrators to help form an exhibition of student work at the Congress. However, requests for an extension of time were received, which was granted.

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Oddly enough, this did not militate against the one man who complied with the original time limit, for though at present the writer has received about one hundred and fifty inlays, none has surpassed that first one, and the medal therefore goes to Mr. N. C. Gunter, a second-year man in the Colorado College of Dental Surgery, who submitted four beautiful inlays, the first and best specimen being a large restoration of a lower first molar, the inlay involving practically all the crown except the buccal wall.

Only one prize had been offered, but Mr. Oscar Wiggers, of the senior class of Temple College, Philadelphia, a native of Denmark, submitted a beautiful exhibit, including the restoration of molar occlusal surfaces at the ages (approximately) of sixteen, thirty-five, sixty and seventy-five, in which he discloses a keen appreciation of the demands at various ages. Moreover, he submitted eight other inlays, ranging from moderate size to full crowns, and the entire exhibit was beautifully mounted on turned brass pedestals and attached to a mahogany board.

The man had done so much work, and his work as a whole was so good, that the writer found it hard to deprive him of the medal. Nevertheless, the prize had been offered for the one best inlay, and by this rule Mr. Gunter won. However, Dr. J. Lowe Young was invited to examine and judge the exhibit, and did so without knowing the choice already made, and he also awarded the medal to Mr. Gunter. Yet he, too, was so impressed with the exhibit of Mr. Oscar Wiggers, that he suggested that we jointly award him a gold medal for general excellence, which has been done.

Basis of the Final Decision.

It is interesting to note the extent to which the work of these students has reflected the teaching in their schools. For example, twenty-five inlays, all from one school, are all made in the same general manner, and show the same class of defects. The same is true of an exhibit of over thirty inlays from another school. From two or three schools, natural molars were received in which had been cemented inlays which by their presence removed every trace of occusal form. Yet these inlays came, accompanied by letters from the demonstrators, vouching for the fact that the inlays had been made by the men sending them and under the supervision of the demonstrators. What moral shall we draw from this? What else can we believe except that the standards of

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these demonstrators were no higher than that shown in these flat-surface inlays.

It was gratifying, however, to find that out of one hundred and fifty specimens sent in, all with the exception of five or six, at least, show an attempt at carving to imitate occlusal form. On the other hand, with the exception of the inlays sent in by the winner, and one other student from the same school, none evidenced a proper regard for the value of true and deep sulci, marginal ridges and grooves. A great number attempted to simulate cusps and sulci, but invariably the cusps are formed with round, smooth surfaces, entirely devoid of grooves and with little resemblance to true cusp forms; while the sulci are seen to have rounded bottoms.

Mr. Gunter's inlays escaped these faults to a greater extent than any other. His inlays were copies of natural teeth, and while not absolutely correct, nevertheless showed a comprehension of requirements and a knowledge of the mechanics of mastication.

Exactly in this detail did Mr. Wiggers fall behind, and that his work, like all the others, was but a reflex of his teaching, is proven by the fact that when he asked Dr. Young and the writer to criticize his work, and we then proceeded to explain to him the true purposes of the sulci, grooves and marginal ridges, he admitted that he was hearing this teaching for the first time.

Erroneous Method of Teaching Inlay Carving.

It is very evident that Mr. Gunter was aided in winning his prize by the fact that he had been taught by Dr. Frahm, and also because of a method of teaching followed in that school. It appears that Dr. Frahm found a patient having remarkably typical teeth, with long cusps, deep sulci and well-marked marginal ridges and grooves. He obtained occluding models of this splendid set of teeth and with gelatin molds duplicated them in quantity. These casts are supplied to students and serve as models for carving teeth and inlays.

Mr. Gunter's first inlay was sent on a part of one of these casts which showed the second and third molars, the bicuspids and the cuspids, the first molar being replaced by an amalgam die carrying the gold inlay. It was evident from a study of the second molar on this cast that this inlay was fairly true to nature, but the writer has subsequently obtained

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the full casts, and has thus had opportunity to compare the inlay with the tooth of which it is a copy.

The vast majority of the inlays submitted were made in teeth carved from vegetable ivory, or made of celluloid. This method is wholly wrong, if the reproduction of tooth form with cast gold inlays be the object. Not one student in a thousand can carve from ivory an exact replica of a human tooth (and celluloid technic teeth are far from nature). If, then, he is permitted to use this ivory tooth, to carve a cavity therein, and then for this cavity to make an inlay, is it not patent that the best possible result would be a restoration of the original ivory tooth, which itself was erroneously shaped?. The ivory tooth carved by the student might serve as a model in which to cut cavities, and thus learn the science of cavity formation, but even for this work would not the plaster casts from real teeth, as utilized by Dr. Frahm, better serve to accustom the student to deal with actual tooth surfaces? However that may be, it certainly seems true that Dr. Frahm's method of furnishing his students with true tooth forms from which to copy when carving inlays is a better teaching method than to have the student make inlays for teeth carved by himself.

Form Better than Finish.

One other point was brought out in a study of the specimens, and more particularly in conversation with Mr. Wiggers. This gentleman thought that his sulci were better as originally carved, but that they had become rounded by using oil of cajaput in polishing his wax patterns. This is so possible that it is worthy of special note.

Fine finish is most desirable, but it should never be sought at the expense of form. A beautifully carved wax pattern may have its best lines obliterated by a too free use of a lubricant to polish the wax. Later a beautiful casting may be similarly marred by careless lathe work. A gold inlay properly carved, when once cast, should have its occlusal surface polished only with brushes on the lathe, or with burnishers, the latter to be preferred, because a burnisher, properly used, accentuates the grooves, thus adding to the masticatory usefulness. Moreover, the burnishing hardens the surface. The best burnisher for this purpose is one of tantulum ground to a hatchet shape, so as not to round the bottoms of the sulci.

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Non-recognition of Dentists.

A bill has been introduced into the United States Senate (H R 6282, calendar No. 213) under date of June 5th, which is entitled, "An act to provide for the registration of, for collectors of internal revenue, and to impose a special tax upon all persons who produce, import, manufacture, compound, deal in, dispense, sell, distribute, or give away opium or cocoa leaves, their source, derivative, or preparations, and for other purposes."

The general purpose of this bill, of course, is to regulate the manufacture and sale of these drugs in such a way that the United States Government may have some control over those who use the drugs for vicious purposes.

The interest to the dental profession lies in the fact that there is nothing in the act which would include dentists among those who might register and thus become authorized to use the drug. The Internal Revenue Department say that if the act is passed they will register physicians, dentists and veterinary surgeons under the word "dispense," but it is difficult to understand how the dental uses of cocain can be brought within the meaning of the word "dispense."

A copy of this bill has been brought to our attention too late for an extended study and analysis of it. We, therefore, merely publish this notification to the dental profession.



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THE LAST CONTRIBUTION to this department has brought us some very nice letters; letters that are most satisfactory; but beyond expressing appreciation and thanks to the writers, modesty forbids us to pursue the subject. However, there is no harm to say *en passant*, that this little old world is not so large but that we can have a few neighbors. One real neighborly letter was postmarked at Pasadena, Cal., and you can't get much farther from New York and still be in the United States, now can you? Yet it seems I have a neighbor out there. Greetings, neighbor!

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THERE IS ONE letter, however, that I think was meant for publication. It comes from our old Colorado friend, E. J. K. This is how he phrases it. He says: "I am glad that I have had at least one reply to my remarks published in the April number. Dr. Hyatt is all right, nursery rhymes and all, but I take exception to one or two of his statements, made in the June number. First he says, 'No one can consider me a member of the Old Guard.' Why, then, does he rally to their support so nobly? I have given clinics at State society meetings, only to have one of our Old Guard crowd up and remark, 'Oh, I did that twenty years ago!'"

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BY THE WAY, why don't these Old Timers vary that phrase and make it nineteen years or less sometimes? Funny that the New Fellow always comes into the limelight just twenty years after the Dear Old Man did it himself!

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RETURNING TO E. J. K.'s letter, with apologies for the interruption, he goes on to say: "Is that encouraging for the little fellow who has spent his time to work out what at least he thinks is worth while, and what he is quite willing to give to others?" Again quoting Dr. Hyatt he says: "It is the big fellows of the Old Guard who are the first to welcome the beginner in his efforts to contribute something toward the uplift of the profession." Well, I wish Dr. Hyatt would show me when and where. How about oral prophylaxis? I suppose that was met with open arms!

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And it was not started by the little fellows, either. Only last year one of our best prophylaxis specialists of the East read a paper at a State society meeting a thousand miles away from home, by invitation, if you please, and was criticized by several of the Highbrows. One man of prominence said in the discussion: "If Dr. ——— has told us anything except how to clean teeth I have failed to hear it." A classic and comprehending commentary.

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"HOW MUCH ENCOURAGEMENT did Ebersole receive when he started his campaign for Mouth Hygiene? What about Taggart? What percentage of the profession do you suppose have taken up the best thing along the lines of progress advanced in the last year? I allude to the anatomical restoration of occlusion with properly carved and cast inlays, as advocated by Young and Ottolengui! Dr. Angle covers the situation better than anyone I have heard when, speaking of the Old School, he says: "Their opposition has taken the usual form of opposition to progress in religion, science, and politics; namely, to first ignore, then to declare, 'It is not true,' and finally to announce, 'We have always believed.'"

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THERE IS MUCH truth in what E. J. K. tells us, but it is not true of all the members of the Old Guard. Moreover, we must not forget that the Little Fellow is going to join the Old Guard some day. What then?

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YOU MAY REMEMBER that awhile back I suggested that we might discuss the question of removing pulps before the application of shell gold crowns. Up to date the rush of letters on this subject has not clogged the mails, nor even littered up our desk. I have heard one little outcry, however. I was just swallowing the last bit of my strawberry short cake at the Grill of the Hotel Ten Eyck, during the meeting of the New York State Dental Society at Albany last month, when my good friend Thompkins, Thompkins of Utica, loomed in the offing. Pardon the sailor-like language, but I have been reading how the Resolute beat the Vanite, and that the Defiance still has a chance, etc., etc., and my mind is just a little yachty. What is that? No, I said yachty. I never use slang. But we left Thompkins in the offing.

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"COME WITH ME," said friend Thompkins, in a voice that sounded like the command of a secret agent of the Camorra, whatever that is. But, having fed well, I took my courage in hand, and went with him. He led me toward the Education Building, where the meetings were held, and partly, I suppose, to aid in my education, as soon as he had me in the shadow of the great structure he continued in his most impressive manner: "A molar which is to have a shell crown attached needs to have its pulp removed just as much as an elephant needs a spring overcoat!"

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THE PICTURE of an elephant in a spring overcoat rather awed me. Really, I could not imagine why an elephant would require an overcoat of any kind, considering the toughness of his regular coat. So I thought it best not to interrupt, but just to listen. Friend Thompkins gave me a few

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minutes to digest that Elephant and Overcoat, and then added: "I suppose the 'pulpicides' in New York will argue that you have found a great many dead pulps under shell crowns, but I ask you, have you not found dead pulps under your large gold fillings and inlays likewise?"

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THOMPKINS DID NOT give me time to telegraph the boys in New York for a reply, but went right on to answer, "You certainly have. Why, then, should you remove a pulp from a molar you are about to crown? Not because of the mere fact that it is to carry a crown. You should examine the tooth and determine whether or not the pulp should be removed, entirely aside from all question of crowning it. The fact is that teeth that are crowned usually are already badly carious. If not, a filling would be inserted. If carious, very often the pulp is already infected, and the man who erroneously crowns such a tooth, later finds a dead pulp, and possibly an abscess, not because of the crown that was placed, but because that pulp was destined to die in any event. We should discriminate, not jump to conclusions."

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JUST SO, and if we do discriminate we must take into consideration the pulps that have died where crowns have been placed over perfectly healthy, sound teeth, teeth having no caries and presumably no pulp disturbance of any sort prior to the crowning. Yet, subsequent to placing the crown, we have patients complaining of mysterious neuralgic pains, even where the pulps remain alive. And sometimes we know the pulp dies, because we discover a nice little fistula right over the main abutment of our beautiful little bridge. And we just hate the sight of that fistula, because the man has just paid the last instalment on that bridge, and it annoys us, it really does annoy us to have him ask, "Doctor, what are you going to do about that gum boil?"

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NOW, ISN'T THAT a mean question for a patient to ask? Do we want to tell that man that that is not a gum boil, but a regular abscess; and that a regular abscess means an abscess that discharges pus into his mouth regularly every morning before breakfast, and that he swallows it with his poached eggs? Do we want to tell him all the different diseases that Grieves, Rhein and Hartzell say he can get if that abscess is not cured? Above all, do we want to tell him that the only way to cure the abscess is to take the old bridge off, treat the tooth and make a new bridge, with a new set of instalments? Do we want to tell the man all these things? We do not! Then don't we wish we had taken that pulp out in the first place? We do! Well, then, there you are.

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BUT DON'T LET me influence you. Use your own judgment. Leave those pulps in and crown the tooth, or take them out before you crown the teeth. But whichever you do, write and tells us about it, and why. There must be others besides Thompkins with courage to talk on this subject. Here is a chance for those Little Fellows that have been championed by E. J. K.

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WITHOUT GOING further into the general discussion at present, I will at least reply to one of Dr. Thompkins's statements. He suggests the idea that pulps often die under large gold fillings and inlays. This is quite true, and when we made large gold fillings by hammering them in, this was a most difficult problem. It often taxed the best judgment to determine whether to remove a pulp before filling or not. The long hammering itself became a factor that might cause the ultimate death of a pulp. But let me indicate to you a most useful method of dealing with such caries, now that we have the inlay process.

LET US SUPPOSE that we have a large cavity in a molar or bicuspid, and after removal of the decay the pulp is almost exposed and the tooth very sensitive. I will not here discuss the methods by which we may determine whether it may be safe to attempt conservation of the pulp, except to say that a conservative method is demanded in proportion to the youth of the patient. At the age of twelve to fourteen or sixteen every risk should be taken. As the patient is older it is less excusable to take any risk.

HAVING DETERMINED to make an attempt to conserve the life of the pulp, the pattern for a cast gold inlay should be made without the interposition of any capping of any kind. The pattern having been obtained, its reverse side should be carefully studied and a cavity cut in it as large as may be without interfering with the retention of the inlay. This hollow in the underside of the inlay pattern should be extended toward the occlusal surface until when held up to the light the wax is seen to be so thin as to easily transmit light rays. By this means we secure an inlay when cast which, at exactly the proper situation presents a very thin layer of gold, easily punctured in case it should become necessary subsequently to drill through because of death of the pulp.

I HAVE NO DOUBT that many practitioners have followed this method, but the majority, so far as I know, then make the mistake of filling this hollow part of the inlay with cement at the time of setting. It is manifest that in case the pulp should die and the tooth become sore it will be a painful procedure to drill through this mass of cement after puncturing the gold. The better procedure is to fill this hollow part of the inlay with gutta percha, or even soft gutta percha, 'temporary stopping.' By this means the mass of gutta percha acts as a non-conductor over the point nearest to the pulp, and in case any subsequent opening of the tooth is required, the drill easily penetrates the soft mass.

I HAVE DONE this operation a great number of times, and thus far have only once had the pulp die, probably because, being one of the New York "pulpicides," I do not take very great chances. But in one instance, in a lower first molar, I did place a very large inlay restoration over a pulp that was very doubtful in character. The tooth annoyed for some weeks, and finally became quiet so suddenly that I became suspicious. Upon investigation I diagnosed death of the pulp. I drilled

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through the inlay, easily passed through the gutta percha, and eventually removed the dead pulp, filled the canals and set a new inlay, which fitted into the old one as a cork fits a bottle. That is to say, all margins of the new inlay were in the old, no part touching tooth substance.

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IF THE ORIGINAL inlay had good margins, and, of course, it would have if you or I made it, care should be taken when drilling through it not to cut through the original gold into contact with any margin, for the reason that this might disturb the first plan of retention. If the second inlay fits the first like a cork in a bottle, that is to say, with slightly sloping sides, when set it may be driven to place so tight that if stones are used while the cement is yet somewhat soft the eye will be unable to detect any line of demarcation between the old and the new gold.

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Surgical Treatment of Pyorrhea.

Editor ITEMS OF INTEREST.

Dear Sir:

In the June ITEMS OF INTEREST appears a letter from Dr. T. B. Heckert, saying in substance that he has been operating for and curing Riggs disease by cutting away the gum overlapping the pocket—"eliminating the pocket entirely," as he puts it. He cites cases and says from these:

"I conclude from these cases that we can cure pyorrhea by eliminating the pocket, either with medicines or the knife."

Again he says:

"I cut the gum away entirely and claim that this alone will cure any case of pyorrhea where there is sufficient bone left to retain the tooth."

At first thought, this reminds me of the old woman who advised her daughter to cut holes out of her dress. Dr. Heckert, I am sure, has spoken prematurely in these statements, and it is evident they are written in an enthusiasm that he will not entirely entertain later on.

In the same issue of the ITEMS OF INTEREST is a letter from you to Dr. Heckert, saying that you were present at the reading of a paper by me and that, between snores, you caught the idea that I advocated "incision of the part to the apex of the root to facilitate thorough cleansing." With all due respect to your waking moments, I plead not guilty. If you dreamed this, it was enough to wake you up with the impression hanging to you.

It is oftentimes advisable (in a deep pocket) to incise the gum *from the margin to the alveolus.* To cut further would be useless. This would afford us no access to the root above the edge of the bone unless we cut away the alveolus itself.

It is also sometimes advantageous to incise the *bottom of the pocket to the alveolus* throughout the entire extent of the pocket. This allows us free play to do a clean-cut piece of surgery and plane the root surface.

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This planning of the root surface *after* the incision of the gum tissue is the operation you refer to as having been given to the profession by me about fourteen years ago. It was to do this operation that the various planing instruments have been later devised.

I believe the paper to which you refer as having heard me read is to appear shortly in ITEMS OF INTEREST. I trust the readers will escape the analgesic effect which the paper seems to have had on the editor; unless, indeed, it makes it less painful to them.

Referring again to Dr. Heckert's procedure, I will say, notwithstanding my criticism above, that there is certainly some merit in it. It is of distinct advantage in a case *now and then* to cut away the gum tissue, "eliminating the pocket." However, it is in my opinion advisable only in a very limited proportion of cases. Dr. Heckert is certainly correct in his idea that the gum should *heal to the bone*—or at least in about its normal relation to the bone at all points. Unless this follows operations we will have no cure, not even if all pus is stopped, notwithstanding how healthy the gum may appear at the time. In other words, Dr. Heckert's idea is that there should be no soft tissue stretched over root surface to which it is not attached, and certainly this is a correct idea. I am glad he has expressed himself. It is a good thought and stimulates thought and experiment on the part of others. The fact that Dr. Heckert thought he was advancing this thought for the first time shows, as you have intimated, how nearly it is true that "there is nothing new under the sun."

When I first began to cut away the gum over pockets I thought it was original with me (and so it was—and so it was with Dr. Heckert, also), but later I found this was advocated in dental literature more than a century ago. Even my own pet operation of planing the roots *was* simply *advanced* first by me as an idea; *not* the actual operation itself, because *all men have been doing this more or less* while *trying to scrape off deposits*. The instruments of Dr. Riggs himself were admirably adapted for this purpose, and in his operations he *unconsciously removed the surface* of the cementum, while, as he thought, he was only vigorously scraping away deposits from all over the root surface, and so I was only the first to advance the idea of planing the root surface—not the first one to do it, although, so far as I know, I was the first one to do it *intentionally*.

In answer to your letter to him, Dr. Heckert says:

"I cut the gum away entirely and claim that this alone will cure any case of pyorrhea where there is sufficient alveolar process to retain the tooth."

Dr. Heckert does not do himself justice in stating his opinion in

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just this way. There is no royal road nor easy way to the cure of Riggs disease. In a paper read before the National Dental Association six years ago at Birmingham, Alabama, entitled "Riggs Disease, Yesterday, To-day and To-morrow," I tried to make it plain that the one chief reason that we as a profession still fail in the treatment of this trouble was that we had been seeking for a way—or a remedy with which to cure it—that we did not get at the underlying principles—that we had failed utterly to gather together and systematize and put to practical use all the good and useful things advocated by the different men who were if you please *cranks* on this subject. We would take up what one man advocated, try it indifferently and fail, and then another man's ideas and fail, and another and another—fail in all—and then say *there is* no cure, just as men will see Dr. Heckert's idea, try it on the wrong case, fail, and say there is nothing to it.

Now, I want to ask Dr. Heckert to consent to try out thoroughly his method for one year, and then to report to us through the ITEMS OF INTEREST the results. I am sure he will report some good results from this procedure, and also good results from other procedures where this is not applicable. Of one thing he may rest assured, that generally speaking, "eliminating the pocket" is only a small part of curing Riggs disease.

Sincerely yours,

HOWARD STEWART.

New York City, June 10th.

Editor ITEMS OF INTEREST.

Dear Sir:

Regarding the method advanced as a cure for pyorrhea alveolaris by Dr. T. B. Heckert in the June issue of the ITEMS OF INTEREST, I wish to corrobate his statement as to the efficacy of this rational surgical procedure. My clinical records for the past few years will substantiate the fact that I have found this procedure most effective as a cure in cases of true pyorrhea, uncomplicated by systemic disorders, and in the latter conditions a means of quickly removing distressing local complications, with the possible exception of those diabetic cases which are sometimes unfavorable for operation.

I cannot agree, however, with Dr. Heckert about cutting the gum away entirely. I do not see the necessity for this radicalism.

Where the root is a long one and the incision necessary to expose sound alveolar tissue is long, I use small ocular retractors as an aid in keeping the operative field clear. Then I sometimes bring the edges of the wound together, holding by suture. This in most cases is unnecessary,

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While I do not claim that this method is a panacea for all cases of pyorrhea alveolaris, I think it deserves a high place in our efforts to control these cases. I am,

Respectfully yours,

MILTON L. SIMON, D.D.S.

New York City, June 12th.

Editor ITEMS OF INTEREST.

Dear Sir:

I wish to reply to Dr. Heckert's letter in the ITEMS OF INTEREST for June. I had a case of pyorrhea in an upper left central in a patient 75 years old, and I split the gums wide open to the apex of the root and scaled the tooth, washed it out thoroughly with antiseptic solution, and gave the patient instructions to keep it clean with antiseptic wash, tooth brush and paste. I obtained beautiful results. I did not keep a record of how long it took to cure it, but it healed thoroughly. The pocket extended on the labial surface to the apex of the root. I did not have much hope of saving the tooth at the time, but, nevertheless, I did save it. I found the tooth to be very sensitive, but believe this will pass away in time. I firmly believe in this method in cases of this kind. I am,

Yours respectfully,

A. E. NORTON.

San Antonio, Texas, June 8th.

Editor ITEMS OF INTEREST.

Dear Sir:

I have been reading in your June issue, under "Correspondence," a "cure for pyorrhea alveolaris," signed by T. B. Heckert, D.D.S.

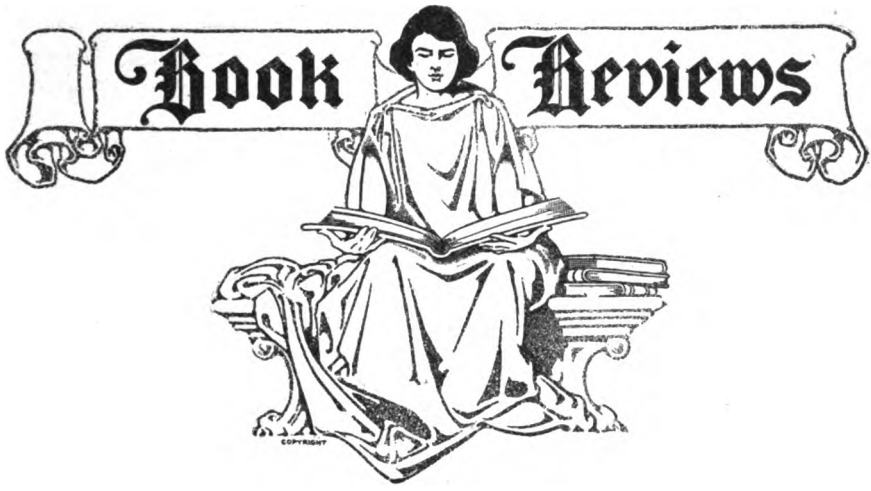
It might be of a little interest to Dr. Heckert and others to know that some three years ago a patient presented herself at my office with an extreme case of pyorrhea. The gums were badly congested, deep pockets, etc. Without going into detail, I used the knife freely down to sound process. I then sprayed out with peroxide and removed the deposits and prescribed a mouth wash, which was kept up for some time after gums healed. All conditions of pyorrhea were eliminated and teeth rigid, and have continued so. The only condition that has not been favorable is that the gums did not return to their natural condition on the teeth, the neck of the teeth showing some; otherwise the treatment and cure was a success. I am,

Yours truly,

BERT A. BURNS, D.D.S.

Narragansett Pier, R. I., June 18.

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Local Anesthesia in Dentistry.

By Professor Guido Fischer, Marburg.

New Edition (Die lokale Anästhesie in der Zahnheilkunde—dritte Auflage).
American Edition published by Lea Febriger & Co., Philadelphia.
Review by David Fyfe, F.R.C.S.E., D.D.S., Etc., Glasgow.

One of the most important branches of modern dentistry is that of anesthesia. Prof. Fischer, with that wonderful patient scientific outlook and mind so characteristic of German scientists, has brought local anesthesia in its use for dental purposes to a high degree of perfection. The writer of this review procured on its first issue a copy of the excellent English translation by Dr. Rathmuller, of Professor Fischer's second edition of his book on local anesthesia. He was so struck with the importance of this class of work that he took the first available opportunity (which only occurred last autumn) of visiting and having personal study with Professor Fischer in the University Clinik at Marburg.

Use of Novocain.

Several important advances have been made since the English edition was published. The anesthetic used is still novocain with a small percentage of synthetic suprarenin. The novocain-suprarenin is used in the form of tabloids. These tabloids must be *absolutely white in color;* any darkening or other discoloration must be discarded as dangerous. Many of the adverse reports on novocain are the result of using solutions which have decomposed and become toxic (whether this

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toxic change is in the suprarenin or the novocain is not quite clear). The solution used in which these tabloids are dissolved is Ringer's solution—the formula for which is:

℞ Sodium Chloride .....gram .05
Potassium Chloride ..... " 0.002
Calcium Chloride ..... " 0.004
Distilled Water .....ad 10 c.c.

Thus we see that thymol is no longer used as an ingredient. The solution must be carefully prepared with distilled water and must be absolutely sterile. The glass of the bottle in which the solution is kept must be alkali-free, otherwise the fluid becomes alkaline. The necessity for the solution being neutral in reaction is seen when one realizes that novocain is slightly acid. If alkaline, a pinkish discoloration results on the addition of the novocain, which must not be injected. The research work of such men as Fischer has emphasized the enormous importance of absolute asepsis in local anesthesia.

In *preparing Ringer's solution,* the writer has a reliable pharmacist prepare a few ounces guaranteed absolutely sterile. This is kept in a well-stoppered alkali-free glass bottle. The necessary quantity is poured into a small, thoroughly washed porcelain dish (with a handle). This is thoroughly boiled, then a novocain tabloid added and reboiled. It is wise to remove the stopper from the bottle over a Bunsen flame, thus sterilizing that part over which the solution must flow. Professor Fischer has tabloids prepared for him containing the ingredients of Ringer. He prepares about one ounce of the solution, which he keeps in a small bottle. This bottle is kept in a small electric sterilizer, and is always brought to the boiling point before the necessary quantity of the fluid is poured into the small mixing dish. He again boils after the novocain tabloid has been added. It is unwise to keep the Ringer solution too long, as it tends to decompose. Even the Ringer tabloids are better not used after a few months; completely fresh ones should be made.

The novocain solution may be used in the strength of 1%, 1½%, or 2%, depending on the depth of anesthesia required, also on the physical condition of the patient, a young child or a feeble adult having the lower percentages injected.

Treatment of Hypodermic Syringes.

The treatment of the hypodermic syringe is most important. The needles are made of iridio-platinum and can thus be passed into the flame and rendered absolutely sterile. Fischer has a glass jar (specially made for the purpose) with a tightly fitting glass lid. A metal stand, capable of holding three syringes, needles

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downwards, is fitted into the jar, which is half filled with a solution composed of three parts absolute alcohol to one part pure glycerine (the glycerine absorbs any water that may get into the alcohol). The syringes are kept in this solution. Before being used the syringe must have some boiled water drawn into it to get rid of any sterilizing fluid in the barrel. The iridio-platinum needle is passed into a flame and made red-hot, then placed in the anesthetic solution and the syringe filled. These iridio-platinum needles are not removed from their syringes until they break or are otherwise rendered useless, when a new one is fitted. The hypodermics used by Fischer are of his own design and are excellent —all parts being of glass and metal. The plunger and barrel are so carefully fitted that a high degree of pressure is obtainable, this being necessary when injecting solutions under the periosteum.

Sterilization of Gum Tissue.

Sterilization of the gums before injecting is most important. This he still does by the use of tincture of iodine. A pledget of cotton wool on an instrument is saturated with tincture of iodine and the parts to be sterilized rubbed—not simply swabbed—with the solution. The rubbing is most important, as it mechanically cleanses the gums: thus mechanical cleansing plus fixation and destruction of micro-organisms is obtained.

Neck Bandage.

Another point emphasized by Professor Fischer is the use of the neck bandage—so called stasis bandage. This has been advocated in the English edition of this book. Time and experience have proved the importance of this procedure, more particularly with injections used to block the nerve trunks (conduction anesthesia), such as mandibular injections. In these cases a comparatively large quantity of the solution is thrown into loose tissue, and thus more quickly absorbed. The writer of this review has had a feeling that many of the annoying symptoms observed—when all aseptic precautions have been carefully carried out—such as faintness, quick pulse and semi-hysterical conditions, are due to the suprarenium, not to the novocain. A possible psychic influence must not be overlooked.

A London doctor, reporting in the *British Medical Journal* of May 2, 1914, says he gave himself an injection of 3 minums 1 in 1.000 adrenalin chloride solution, which was followed by a feeling of extreme illness. He had quick pulse, shaking, etc. Fischer insists that the neck bandage is a valuable means of lessening many of these troublesome symptoms. It acts by pressure on the superficial veins of the neck, thus lessening the tendency to anæmia of the brain.

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Conductive Anesthesia.

The technique in conductive and local anesthesia is unchanged from that found in the English translation. Fischer is a firm believer in conductive mandibular anesthesia. He has found local anesthesia of the mandible, more particularly in the premolar and molar regions, most unsatisfactory, and almost exclusively uses the conductive method by injecting in the region of the inferior dental foramina. He very often injects into the region of both foramina, thus having complete anesthesia of entire lower jaw (and part of tongue). The present writer can testify to the efficiency of the anesthesia. He had a single injection made (*i. e.*, on one side only). Within five minutes the entire half of the jaw was absolutely anesthetized, the edge of the tongue, lip and external aspect of lower jaw being also involved in the anesthesia. In about an hour sensation was re-established. The injection was quite painless and was followed by no after pain nor disagreeable results beyond some anxiety (entirely psychic in its origin). I think it wise to avoid unnecessary conductive anesthesia in very high-strung and imaginative people, unless the operator be able to stand by and control the workings of the patient's mind.

Novocain Failure in Local Anesthesia.

As a local injection in the mandible, novocain is a comparative failure. There is thus still ample field for research in local anesthetics. It is asserted that novocain is as powerful in its anesthetic properties as cocaine, while having only one-sixth of its toxicity. The writer quite believes in the comparative non-toxicity of novocain, and thus considers it the only anesthetic suitable in conductive anesthesia (combined with the stasis bandage). Any preparation of cocaine is positively dangerous when used for conductive work, this due to the amount of the anesthetic and the laxness of the tissue into which the drug is injected, allowing of quick absorption into the general system. The statement as to its equality with cocain or alypin as an anesthetic is not shown to be correct in clinical investigation. For satisfactory local anesthesia of the mandible some other anesthesia than novocain is necessary. The really ideal local anesthetic is still to be found.

When Local Anesthesia Succeeds.

In the maxilla, on the other hand, the results of local anesthesia with novocain are excellent. The injection must be made under the periosteum and with considerable pressure, as explained in the English translation. Fischer uses the same technique as that given in his former books for conductive anesthesia of the maxilla. He injects (with blunt needle) into the region of Meckel's Ganglion, and may inject both sides of the maxilla, thus giving a most efficient

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anesthesia (sufficient to do a serious operation). For simple extractions or pulp work, local anesthesia is so thoroughly satisfactory that the writer has never seen any necessity for the more difficult conductive injection. There are two regions in the maxilla, to which special attention may be drawn, although they are really conduction anesthesia regions; the technique of injection is as simple as that of the local. One is the region of the large foramina, through which branches of the posterior superior dental nerve enter the maxilla. The needle is passed into the tissues at the junction of the gum with the cheek approximately above the second molar. The needle then passes upward and backward close to the bone (and with the opening of the needle facing the bone) behind the zygoma (which should be palpated with a finger). The other region is that of the posterior palatine foramen which lies close to the palatine aspect of the last erupted molar. Fischer never injects into the region of the anterior palatine fossa, *i. e.*, immediately behind and between the superior central incisors. The result of such an injection is acute pain, with no compensating results. Injection in the region of the infra-orbital foramen for conduction anesthesia is not very satisfactory. The value of a simple subperiosteal (local) injection in cases of hypersensitive dentine is undoubted, especially in the maxilla. A few minutes (about ten) should elapse from the time of the injection until work on the tooth is attempted. Fischer has nothing to say about so-called intra-alveolar injection. The results of such injections are excellent, and if carried out with the same aseptic precautions as taught by Fischer in his works no one should fear the slightest untoward result. The greatest difficulty in all forms of injection anesthesia is the preliminary pain of the needle. When this can be overcome we shall have gone far in perfecting methods of anesthesia. There is still ample field for research in anesthetic substances. So far we have not found the ideal. To those who have not read Professor Fischer's book on anesthesia the writer would most heartily recommend the English edition—which is excellently translated. The later developments given in this review will bring the reader up to date in this important subject.

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Dr. Vines Edmunds Turner.

Dr. Vines Edmunds Turner died in Raleigh, N. C., at his home on May 11, 1914.

Dr. Turner was born in Franklin County, N. C., on January 21, 1837, being seventy-seven years of age at te time of his death.

He attended high school at Henderson, N. C., preparatory to entering college, but abandoned this to assist his brother in the hardware business. Later he attended the Baltimore College of Dental Surgery, graduating in March, 1858, and practiced dentistry at Henderson until the outbreak of the Civil War. He then entered the Confederate Army service in 1861 as Second Liutenant of Infantry. Later, was promoted to be adjutant of the Twenty-third North Carolina Regiment in 1862. Became a captain in 1863 and was serving on the staff of Major-General James A. Walker at the time of Lee's surrender. He was wounded in the battle of Cold Harbor in 1862, went through all the campaigns of the Valley of Virginia under General Jackson Early and was in the third days' fighting at the battle of Gettysburg.

In 1868 he married Miss Rozena Lassiter in Henderson, who died in 1869. In 1874 he married Miss Love Gales Root, of Raleigh, N. C., who survives him, as do also three children by this marriage, Dr. Charles R. Turner, of Philadelphia; Dr. Henry Turner, and Mrs. Henry M. Wilson, of Raleigh, N. C.

Dr. Turner was a charter member and a vice-president of the North Carolina State Dental Society which was organized in 1866; he was a member of the North Carolina State Board of Dental Examiners from the time of its organization; he was president of the Southern Dental Association in 1881; president of the National Association of Dental Examiners in 1901; one of the vice-presidents of the Dental Section of the Ninth International Medical Congress in 1887; president of the Jamestown Dental Conventions of 1907; president of the National Dental Association in 1908; treasurer of the National Dental Association 1904, 1905 and 1906; a member of the Examining Board of the Dental Reserve Corps of the United States Navy at the time of his death.

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He was president and director of the Raleigh Street Railway at its organization in 1887; director of the North Carolina Railway Co. for eight years; one of the organizers and for twenty-seven years director of the Raleigh Savings Bank; a charter member of the Capitol Club of Raleigh. He was also a Mason, likewise Junior Warden of Christ Church, Raleigh.

A complimentary banquet was given to him in 1908 by his colleagues in Raleigh on the occasion of his fiftieth anniversary. Another banquet was given to him and Dr. James McManus in Baltimore in June, 1910.

Dr. Turner was a typical Southern gentleman, mild in manner and lovable in disposition. It is probably absolutely true that he had not an enemy in the world. On the contrary, everyone who learned to know him at all was attracted by his splendid personality and was proud to call him friend.

Dr. Wm. Mitchell.

The many friends in this country of Dr. William Mitchell will be grieved to learn that he died at his residence, 39 Upper Brook St., Grosvenor Sq., London, on June 9th, at the age of 60.

Dr. Mitchell had suffered a long illness and met the end peacefully. The last rites took place at Golders Green on June 11th.

Dr. Mitchell was widely known and much beloved in this country.

Dr. George Arthur Savage.

Dr. George Arthur Savage died in the city of Worcester, Mass., after a brief illness of pneumonia at the age of forty-one years.

He was widely known on account of his porcelain work (bridgework, inlays, jacket crowns, etc.).

He was the son of George E. and Winnifred Morgan Savage and was born in Worcester, Mass. He graduated from the Pennsylvania College of Dentistry in 1900.

He worked for many prominent dentists in this country and in Europe. He was with Dr. Bradbury, of Santa Barbara, Cal., two years.

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National Society Meetings.

AMERICAN INSTITUTE OF DENTAL TEACHERS, Ann Arbor, Mich, January 28-30, 1915.
Secretary, Dr. J. F. Biddle, 517 Arch St., N. S., Pittsburgh, Pa.

NATIONAL DENTAL ASSOCIATION, Rochester, N. Y., July 7-10, 1914.
Secretary, Dr. Otto U. King, Huntington, Ind.

AMERICAN SOCIETY OF ORTHODONTISTS, Toronto, Canada, July 2-3, 1914.
Secretary, Dr. Wm. Ernest Walker, 629-631 Maison Blanche, New Orleans, La.

PANAMA-PACIFIC DENTAL CONGRESS, San Francisco, Cal., 1915.
Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

EUROPEAN ORTHODONTIA SOCIETY, seventh annual meeting, Paris. Grand Hotel Continental, 3 Rue Castiglione, Tuesday, July 28th; Wednesday, July 29th. Clinics, Saturay, August 1st.
Secretary, G. Lind, 542 Keizersgracht, Amsterdam, Holland.

State Society Meetings.

FLORIDA STATE DENTAL SOCIETY, Atlantic Beach, Fla., July 1-2-3, 1914.
Secretary, Dr. Alice P. Butler, Gainesville, Fla.

MINNESOTA STATE DENTAL ASSOCIATION, Duluth, Minn., August 6-8, 1914.
Secretary, Dr. Benjamin Sandy, Syndicate Bldg., Minneapolis, Minn.

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NEW JERSEY STATE DENTAL SOCIETY, Ocean Grove, N. J., July 15-18, 1914.
Secretary, Dr. John C. Forsyth, 430 E. State St., Trenton, N. J.

OHIO STATE DENTAL SOCIETY, Columbus, O., December 1-3, 1914.
Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

VIRGINIA STATE DENTAL ASSOCIATION, Old Point Comfort, Va., July 1-3, 1914.
Secretary, Dr. C. B. Gifford, Norfolk, Va.

WEST VIRGINIA STATE DENTAL SOCIETY, Huntington, W. Va., August 12-14, 1914.
Secretary, Dr. A. C. Plant, 802 Schmulbach Bldg., Wheeling, W. Va.

WISCONSIN STATE DENTAL SOCIETY, Fond-du-Lac, Wis., July 14-16, 1914.
Secretary, Dr. O. G. Krause, Wells Bldg., Milwaukee, Wis.

National Mouth Hygiene Association.

Announcement.

A series of illustrated lectures on Mouth Hygiene is being prepared by this association for rental service.

The first lecture of the series, a talk suitable for a mixed adult audience or school pupils above the age of twelve years (designated as lecture "A"), is now ready.

The lecture set (manuscript and thirty-six lantern slides) will be furnished to members of State dental societies and others who may be considered as competent to present the matter to the public at a rental fee of One Dollar per use.

For further particulars and application blanks, address,

EDWIN N. KENT, D.M.D.,
Director of Extension Lectures.

222 Washington St., Brookline, Mass., U. S. A.

Meeting of National Dental Association.

Railway Passenger Rates, to and from Rochester, N. Y.

(July 7-10, 1914)

1. The railways of the Trunk Line Association covering New York State (east of and including Buffalo, Niagara Falls, and Salamanca), New Jersey, Pennsylvania (east of and including Erie, Oil City, and Pittsburgh), Delaware, Maryland, District of Columbia, Virginia, and West Virginia (east of and including Wheeling, Parkersburg, and Huntington), have given an open rate of two cents per mile in each

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direction in their respective territories with the minimum excursion rate of $1.

Tickets to be sold and good going July 5 to 7, 1914, and returning to reach original starting point not later than July 13th.

2. The New England Passenger Association covering the railways of New England also grant the above privileges and limitations with tickets from their principal stations. The agent at other stations will require not less than forty-eight hours' notice to procure fares and tickets obtainable from the General Passenger Department of the railroad interested.

3. Eastern Canadian Passenger Association, Canada (east of and including Port Arthur, Sault Ste. Marie, and St. Clair and Detroit rivers), declined granting reduced fares.

4. Central Passenger Association—Territory west of Buffalo, Pittsburgh, Wheeling, Parkersburg, and Huntington to and including Chicago, and St. Louis and north of the Ohio River, including Cincinnati, Louisville and Cairo— have granted a rate of two cents per mile in each direction added to the tender received from Trunk Lines, through fares, however, not to be higher than the thirty-day summer tourist fares to Buffalo, N. Y., plus tender covered.

Signature form of tickets to be sold on July 4th-5th-6th with return limit to reach starting point not later than midnight of July 14, 1914, except in border territory common to the Trunk Lines, selling dates July 5th-6th-7th with return limit of July 13th.

Your committee suggests conferring with local agent for excursion rate with longer limit, if desired.

5. Southeastern Passenger Association—Territory south of Ohio and Potomac and east of Mississippi rivers—declined granting a concession in rates and suggest that the summer excursion tickets will be on sale daily before the time of meeting, from the principal stations in their territory, reaching Buffalo, Niagara Falls and other points contiguous to Rochester.

6. Western Passenger Association—Territory west of Chicago, Peoria, and St. Louis to and including Denver, Colo., and Cheyenne, Wyo., state that the summer tourist fares to Eastern sections will be available from principal points in their territory. The general basis of fares—two cents per mile in each direction to their Eastern gateways added to the fares over their lines.

Confer with local ticket agents.

7. Southwestern Passenger Association—Territory southwest of St. Louis, including Texas, Arkansas, Oklahoma, Missouri (south of Missouri River) and Louisiana (west of Mississippi River) and Mexico.

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suggest that the summer excursion rates are practically two cents per mile in each direction. Tickets on sale daily May 15th to September 30th, limited to return October 31st.

Confer with local agent.

8. The territory covered by the Trans-Continental Passenger Association. Pacific Coast and other far western territory not otherwise covered by the above associations, suggest that the summer excursion rate $72.50 is as low as can be granted from San Francisco to Chicago and return. Sale dates for tickets June 29th-30th, and July 2d-3d.

Excursion tickets from Oregon and Washington to Chicago, daily during June and July.

9. Convenient Trains to Rochester:

Lv. St. Louis, Mo., via Big Four Route	11:30	A.M.
" Indianapolis, via Big Four Route	5:50	P.M.
" Cincinnati, O., via Big Four Route	6:05	P.M.
" Dayton, O., via Big Four Route	7:45	P.M.
" Springfield, O., via Big Four Route	8:30	P.M.
" Columbus, O., via Big Four Route	9:55	P.M.
Ar. Rochester, N. Y., via N. Y. Central R. R.	9:21	A.M.

Lv. Chicago, Ill., via Lake Shore & Mich. So. Ry.	5:30	P.M.
" Toledo, O., via Lake Shore & Mich. So. Ry.	11:15	P.M.
Ar. Rochester, N. Y., via N. Y. Central	8:45	A.M.

Lv. Chicago, Ill., via Michigan Central R. R.	5:40	P.M.
" Grand Rapids, Mich., via Michigan Central R. R.	5:10	P.M.
Ar. Rochester, N. Y., via N. Y. Central R. R.	9:21	A.M.

Parlor Cars and Sleepers over these lines reach Rochester via N. Y. Central.

Through tickets to New York permit stopover of ten days at Rochester by depositing ticket at Station Ticket Office immediately upon arrival. A convenience to those joining the European Tour or visiting the Metropolis.

10. From N. Y. to Rochester—Excursion tickets sold July 5th-7th, return by July 13th.

Lv. New York, via N. Y. Central	8:30 A.M.	9:34 P.M.	11:35 P.M.
Ar. Rochester, N. Y., via "	4:05 P.M.	6:30 A.M.	8:13 A.M.

Rate to Rochester—excursion both directions.....$14.45

Lv. New York, N. Y., via West Shore R. R.	8:35 A.M.	7:20 P.M.
Ar. Rochester, N. Y., via West Shore R. R.	6:40 P.M.	5:12 A.M.

Rate to Rochester—excursion both directions.....$13.40

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Lv. New York, N. Y., via Lehigh Valley R. R.,
9:50 A.M. 11:50 A.M. 8:50 P.M.
Ar. Rochester, N. Y., via Lehigh Valley R. R.,
9:44 P.M. 9:44 P.M. 8:25 A.M.
Rate to Rochester—excursion both directions.....$13.40
For ten or more people, traveling on one ticket..... 13.20
Black Diamond Express (11:50 A.M.) fare $13.40; Pullman seat $1.75.

Your committee suggests conferring with local railway agents with reference to excursion rates to Rochester or nearby points, with stopover privileges.

NATIONAL DENTAL ASSN. TRANSPORTATION COMM.
V. H. JACKSON, Chairman.
H. F. HOFFMAN, Denver, Colo.,
L. P. DOTTERER, Charleston, S. C.,
T. S. SMITH, Palo Alto, Cal.,
WM. W. BELCHER, Rochester, N. Y.

Rhode Island Board of Registration in Dentistry.

The Rhode Island Board of Registration in Dentistry will meet in the State House, Providence, R. I., July 1, 2 and 3, 1914.

For applications and further information apply to

ALBERT E. SEAL, Secretary.

12 East Ave., Pawtucket, R. I.

Vermont State Dental Society.

The thirty-eighth annual meeting of the Vermont State Dental Society was held in Rutland, Vt., May 20, 21 and 22, 1914.

The officers elected for the ensuing year are as follows: Thomas Mound, Rutland, president; W. H. McGoff, Montpelier, first vice-president; H. M. Smith, Lyndonville, second vice-president; P. M. Williams. Rutland, secretary; W. H. Munsell, Wells River, treasurer. Executive Committee, G. E. Partridge, Burlington; W. R. Pond, Rutland, and David Manson, Burlington.

P. M. WILLIAMS, Secretary.

Rutland, Vt.

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Arizona Board of Dental Examiners.

The Arizona Board of Dental Examiners will meet at Phœnix, Ariz., beginning October 5, 1914. Prospective candidates should apply at once to Sydney P. Osborn, Secretary of State of Arizona, at Phœnix, Ariz., for an application blank, and return same to him, properly filled out, together with the fee of $25.

DR. J. HARVEY BLAIN, Secretary.

Prescott, Ariz.

Illinois State Dental Society.

Following is a list of officers of the Illinois State Dental Society elected for the ensuing year:

President, J. M. Barcus, Carlinville; Vice-President, J. P. Buckley, Chicago; Secretary, Henry L. Whipple, Quincy; Treasurer, T. P. Donelan, Springfield; Librarian, J. D. Wilson, Danville.

The fifty-first annual meeting is to be held at Peoria, Ill., May 11, 12, 13 and 14, 1915.

HENRY L. WHIPPLE, Secretary.

Quincy, Ill.

The Panama-Pacific Dental Congress.



OPENS AUG. 30TH, 1915

The work of organizing the Panama-Pacific Dental Congress is progressing in a most satisfactory manner, and it is confidently expected that by January 1, 1914, twenty months before the opening of the Congress, all the preliminary work of organization will have been accomplished.

A few foreign countries and a few of our States have yet to appoint Executive Committees to carry on their part of the work of publicity and securing program and memberships. Within the next two weeks invitation will be sent to those who are selected by the Committee of Organization to act as officers of the various sections of the Congress, and in each case an urgent request will be made for a prompt reply, that there may not be experienced in this matter the delay which in some cases has attended the appointment of State and National Executive Committees.

Three hundred thousand "stickers" bearing the seal of the Congress and the date on which it will convene have been sent to dealers in dental

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and pharmaceutical preparations throughout the world, all of whom have expressed a willingness to attach them to every package and letter sent to their customers between now and August 30, 1915. Demands are already being made for more "stickers," and probably one hundred thousand more will be distributed. The Congress will in this way be brought to the attention of every dentist in the world, not once, but many times, and no one will be allowed to forget the date on which he should be in San Francisco to participate in what promises to be the world's greatest Dental Congress.

Work is progressing rapidly on the Auditorium in which the Congress will meet, and it will undoubtedly be housed in one of the largest and most complete buildings ever erected for such a purpose.

Xi Psi Phi Fraternity—National Alumni Association.

"Goodfellowship, not Politics"

The next annual meeting will be held in Rochester, N. Y., Monday, July 6th.

The afternoon entertainment will be under the direction of the Local Committee of Arrangements.

The banquet will be held at 6:30, followed by the annual business meeting.

The Hotel Seneca has been secured as headquarters. Register early in the Xi Psi Phi Parlor on Mezzanine Floor and "get in touch."

Oklahoma State Dental Society.

The following officers were elected by the Oklahoma State Dental Society at its recent annual meeting:

President, J. M. Temples, Tulsa; vice-president, J. H. Sims, Watonga; secretary, C. R. Lawrence, Enid; treasurer, A. B. Walker, Fairview.

The next annual meeting will be held in Oklahoma City about March, 1915.

C. R. LAWRENCE, Secretary.

Enid, Okla.

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DR. GEO. EDWIN HUNT

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Bacteriology in its Relationship to the Oral and Nasal Cavities.

By John Bethune Stein, M.D.
Professor of Physiology and Histology at the New York College of Dentistry, New York.

IV.

Treponema Pallidum.

The Treponema Pallidum (Spirochæta Pallida) (Fig. 43 and Fig. 44, No. 7), discovered in 1905 by Schaudinn, is the causal agent of syphilis. It can be found in the chancre and the adenopathies accompanying the same, in the secondary manifestations of the disease (mucous patches, papules, roseola, etc.) and in the blood of the general circulation (Raubitschek, Noeggerath and Staehelin, Flugel, Nottan-Larrier, Bergeron). Tertiary syphilis is said to be clinically not infectious, but the Treponema has been encountered in tertiary lesions. Finger, Landsteiner, Neisser and Hoffmann have succeeded in infecting apes with fragments of gummata; Hoffmann infected them with the blood from a patient with tertiary syphilis; Tomasczewski, Rille and Vockerodt have seen the Treponema Pallidum in papular tertiary lesions and Spitzer, Doutrelepont, Grouven and Dudgeon have met it in gummata. Treponemata Pallida have been found also in the wall of the aorta in syphilitic aoritis. Noguchi and Moore have demonstrated the Treponema Pallidum in the brains of cases of general paralysis, and it has been

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demonstrated by Noguchi in the spinal cord of a case of locomotor ataxia. It is in the lesions of heredosyphilis that the Treponema Pallidum is found in the greatest numbers. It may be encountered in any organ and may be present within the ova and in the placenta. It can wander between

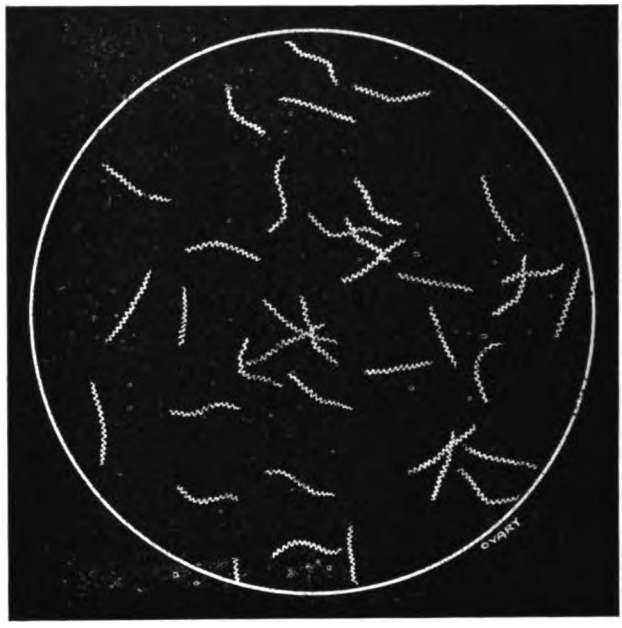


Fig. 43. The Treponema Pallidum as it appears under the Dark-Field Microscope.

the epithelial cells of the skin and mucous membranes, and it is almost always present in the mucus from the mouth, tonsils, pharynx and nose of heredosyphilitics. Hoffmann produced syphilis in an ape by inoculating it with the nasal mucus from a syphilitic man. This spirochæta can be found in the urine of those having syphilitic nephritis, and has been found in the milk and semen of syphilitics. In 1903, Roux and Metchnikoff demonstrated that anthropoid apes were susceptible to syphilis. Syphilis, however, is not so easily generalized in animals as in man. It is possible to produce a syphilitic keratitis and orchitis in a rabbit and a keratitis in a guinea pig; to infect the cat, dog and sheep through the cornea, and Siegel has produced syphilis in a two-days-old mouse by a subcutaneous inoculation of syphilitic material. The Treponema Pallidum can be diffentiated from the other spirochætae by sev-

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eral characteristics. It is pale, with little refringence; has an average length of about 10 to 15 micra; its thickness is only 0.25 of a micron; it has no undulating membrane, is circular in transverse section and has finely pointed ends. The spiral or cork-screw-like form is constantly

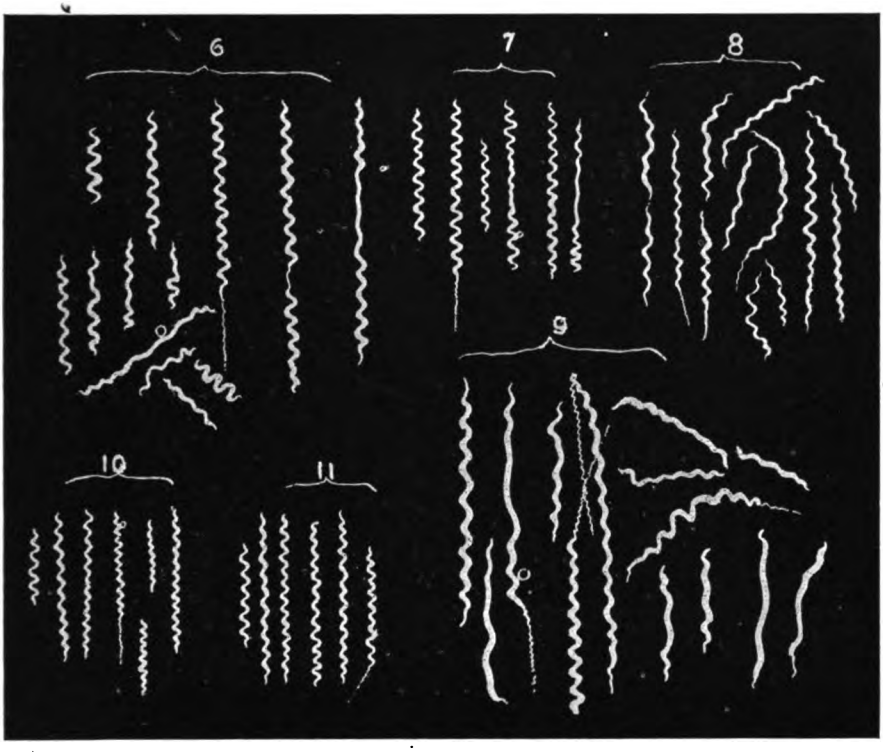


Fig. 44. Schematic Reproduction of Dark-Field Views of Various species of Treponema in Pure Culture: (6) Treponema Calligyrum; (7) Treponema Pallidum; (8) Treponema Macrodentium; (9) Spirochæta Refrigens; (10) Treponema Microdentium; (11) Treponema Mucosum. (From Noguchi.)

maintained by the spirochæta, both while resting or moving. The turns of the spirals are deep, regular, close together, and vary from 6 to 12 and may even be 26 in number. It is also markedly elastic and not easily deformed. In vitro its vitality is considerable, its movements usually ceasing only in five or six hours at room temperature. By evaporation of the medium containing the Treponemata Pallida they are killed quickly, but if the cover glass of a preparation is sealed to the slide with vaseline they may continue their movement for upwards of 33 days (Beers). Gaston and Commandon have found the Treponemata Pallida on a drinking glass after the glass had been immersed in water half an hour.

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The Treponema Pallidum, which is difficult to stain and is colored red by Giemsa, moves by rotation around its long axis, comparatively slowly, at times forwards; sometimes it stops and may move in the opposite direction. There are also undulatory and flexion movements. The movement of the other spirochætae, except the Treponema microdentium, is for the most part sinuous or snakelike; there is also a tendency to lengthen their spirals during rest.

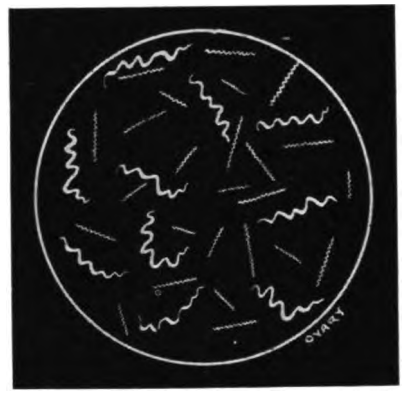


Fig. 45. The Treponema Microdentium and Spirochæta Buccalis as they appear under the Dark-Field Microscope.

The Treponema Pallidum, which is anaërobic, has been successfully cultivated by Mühlens, Hoffmann, Noguchi, and others. The cultures of this micro-organism produce no odor or mucin and its specificity has been demonstrated by the fulfillment of all the conditions of Koch's law.

Spirochæta Refringens.

The Spirochæta Refringens (Fig. 44, No. 9) is found in smegma and in ulcerated lesions of the skin, and may be associated with the Treponema pallidum in syphilitic lesions, but is usually met with on the surface of the lesion and not in the deeper part where the Treponema Pallidum is found. The Spirochæta Refringens is thicker and longer, and when alive very refringent and presents a number of broad, irregular open curves. It often appears to have a membrane and a flagellum attached laterally to the end, and its movement is much more rapid than that of the pallidum and not easy to follow under the microscope. This organism is easy to stain and is colored blue with Giemsa.

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Spirochæta Balanitidis.

The Spirochæta Balanitidis is found in cases of erosive balanitis (Hoffmann and von Prowazek); resembles the Spirochæta refringens and is distinguished from it by a slight difference in its spirals. It presents at times two flagella at one of its ends (Levaditi).

Spirochæta Dentium.

The Spirochæta Dentium, Koch (1877), Miller (1892), well named by Noguchi the Treponema Microdentium (Fig. 44, No. 10, and Fig. 45), is found in the mouth, especially at the margins of the gums and in the cavities of carious teeth, and is more likely to be mistaken for the Treponema pallidum than any other micro-organism. The spiral form, as in the Treponema pallidum, persists in this micro-organism even during rest. It further resembles the Treponema pallidum by being pale, with little refringence, with its spirals close together and very regular, but with the curves not so high as the Treponema pallidum. The average length of this spirochæta is about 4 to 10 micra. It presents a flagellum at one of its extremities, and has been successfully cultivated. Grown on Noguchi's medium, the Treponema Microdentium (Spirochæta Dentium) produces a putrefactive odor, whereas the cultures of the Treponema pallidum grown on the same medium are odorless. This micro-organism is more easily stained than the Treponema pallidum.

irochæta Buccalis.

The Spirochæta Buccalis (Fig. 45), which differs from that which comes from pyorrhœa alveolaris or from the cultures of the Treponema mucosum, was first discovered by Cohn (1872) in the human mouth, and is thick and bulky, with elongated and irregular curves, presenting one or two flagella implanted on its end, similar to those on the Spirochæta refringens. Some consider the Spirochæta Buccalis and Spirochæta refringens identical. Noguchi, who has not succeeded in obtaining this micro-organism in pure culture, says: "The identity of these two spirochætae requires further study." A membrane said to be formed by the débris of the periplasm of the organism at times appears to be present.

Spirochæta Media.

Spirochæta Medica (middle form of Hoffmann and von Prowazek), named by Noguchi the Treponema Macrodentium (Fig. 44, No. 8), is a form between the Spirochæta microdentium and the Spirochæta buccalis. This micro-organism, with the Spirochæta buccalis, is found in the mucus about the tonsils and pharynx and in ulcerative stomatitis. Cultures of this organism, like the Treponema pallidum, produce no odor.

Tunnicliff has found a spirochæta in the nasal mucus of seven out

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of thirty-two cases of rhinitis. In one case a pure culture of the spirillum was obtained from a frontal sinusitis.

Treponema Mucosum.

Of the Treponema Mucosum (Noguchi, 1912) (Fig. 44, No. 11), Noguchi says:

"(1) A mucin-producing spirochæta has been obtained in pure culture from a case of pyorrhœa alveolaris. This organism is an independent species of the genus treponema, and, as it is recognized for the first time I propose for it the name, 'Treponema Mucosum.'

"(2) Morphologically, the mucosum is difficult to separate from the pallidum and microdentium, but, through its biological properties and animal reactions, it is easily differentated from all the rest of the spirochætae.

"(3) The mucosum is not parasitic in the strict sense of the term, but exerts a certain pyogenous action when the tissue has been so injured by foreign substances as to enable it to survive.

"(4) The strong fetid odor in the discharge from pyorrhœa alveolaris is due, at least in part, to the presence of the mucosum in the affected tissue."

Spirochæta in Ulcerated Cancers.

Löwenthal has demonstrated two species of Spirochæta in Ulcerated Cancers, viz., the Spirochæta Micro-Girata and the Spirochæta Löwenthalii. They differ markedly from the Treponema pallidum. Spirochæta of Vincent and Bacillus Fusiformis of Vincent. The Spirochæta of Vincent (46) is associated with the Bacillus Fusiformis of Vincent, in Plaut-Vincent Angina and in lesions of nosocomial gangrene. It has the characteristic of the Spirochæta buccalis and may be confused with it. It is chiefly found in the mouth and may possibly be a saprophytic micro-organism in that locality. It stains blue with Giemsa. Pure cultures of the fusiform bacilli and spirochætae of the Vincent type produce the peculiar fetid odor of pyorrhœa alveolaris.

Larson and Barron report having isolated the Bacillus Fusiformis from the blood of the basilic vein, obtained twenty-four hours before death, from a patient who suffered from an extensive ulceration and necrosis of the upper jaw. The direct smears taken from the buccal ulcerations revealed spirilla and fusiform bacilli. In this case, both the Widal and Wassermann reactions were negative. This case appears to be the first recorded one of the isolation of the Bacillus Fusiformis from the blood stream.

Gerber is convinced that, aside from Vincent's angina, there is a series of inflammatory and ulcerated lesions of the mouth and pharynx which are caused by spirochætae, such as gingivitis, simple or mercurial

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stomatitis, periosteal and peribuccal abscesses, scurvy and perhaps noma. He explains the genesis of these lesions through some general or local alteration in the mucous membrane by cold, poor nutrition, some systemic condition, mercurialization, etc. Spirochætae and the Bacillus fusiformis are always present in the crypts of the tonsils, on the tongue and at the margin of the gums, and, finding favorable soil present for their development, become pathogenic, destroy here and there the epithelium, especially on the tonsils, and produce ulcerations. These lesions so produced constitute a class of which the angina of Vincent is typical. They have the same etiology and an interesting common therapy, *i. e.*, are all said to be cured by salvarsan.

Plaut says he has seen the symbiosis of the Bacillus fusiformis of Vincent and the Spirochæta of Vincent not only in the Plaut-Vincent angina, but also in lesions of the skin and mucous membranes, viz., in cases of stomatitis, noma, syphilis, pyorrhœa, chancroid and fetid bronchitis. He says it is often difficult to determine whether an ulcero-membranous angina is caused by the symbiosis of the Bacillus fusiformis and Spirochæta of Vincent or is a chancre of the tonsil, and a chancre of the tonsil may also at times be infected by the Bacillus fusiformis and Spirochæta of Vincent, when a diagnosis can be made only by finding the Treponema pallidum. A syphilitic angina can at times simulate a Plaut-Vincent one, but the symbiosis of the Bacillus fusiformis and the Spirochæta of Vincent is rare in such a case.

The Bacillus fusiformis and Spirochæta of Vincent may be found associated with the Klebs-Löffler bacillus. They are very frequently found in pyorrhea alveolaris, traumatic ulcerations following the extraction of a tooth or foreign body, in cancer, gangrene of the lungs, in bronchiectasia and in chronic bronchitis with fœtid expectoration. Plaut says the treatment "par excellence" is salvarsan, either locally or intravenously.

Treponema Calligyrum.

Noguchi has obtained in pure culture a spirochæta which he calls the Treponema Calligyrum (a new species) (Fig 44, No. 6), from the surface of genital or anal syphilitic and non-syphilitic lesions, and he says that "it can be distinguished from the Treponema pallidum, Treponema microdentium, Treponema macrodentium, Treponema mucosum and Spirochæta refringens, either by its morphology, cultural and biological properties, or all these conditions in combination."

Spirochæta Phagedenis.

Noguchi also reports the pure cultivation of a hitherto undescribed spiral organism found in phagedenic lesions in the human external genetalia, which he calls the Spirochæta Phagedenis, and says:

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"Its etiologial relation to the phagedenic lesions on the external genitalia has not yet been determined."

When an attempt is made to isolate the different spirilla which may be found in the oral cavity, the possibility of the Spirochæta refringens, Spirochæta balanitidis, Treponema calligyrum and Spirochæta phagedenis entering there accidentally is at least worthy of consideration. The Bacillus coli and the Bacillus smegmatis may be found in the mouth which implies that either direct or indirect contact with the excreta coming from the genito-urinary or intestinal tract has



Fig. 46.

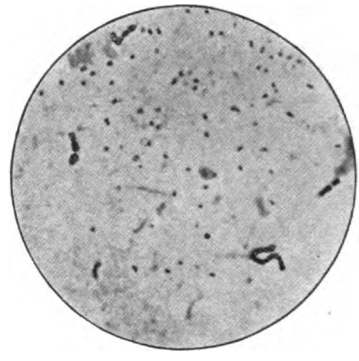


Fig. 47.

Fig. 46. Spirochæta of Vincent and the Bacillus Fusiformis and Leucocytes

Fig. 47. The Minute Micro-organism of Epidemic Poliomyelitis (Noguchi and Flexner). An Agar Fragment showing Pairs of Globoid Bodies compared with Streptococcus Pyogenes. × 1000.

taken place. Do our cooks, bakers, waiters, waitresses, delicatessen men, soda-water fountain men, bartenders, etc., always wash their hands before they handle our food and drink?

For the differential diagnosis of the spirochætae in the mouth and the diagnosis of erythematous, erosive or ulcerous lesions of the buccal cavity, the darkfield-microscope (dunkelfeld or ultra-microscope) is of great importance. Examined with this instrument, the living micro-organism appears white upon a black field. The method of Burri is also useful in detecting the Treponema pallidum.

A most important means of confirming the diagnosis of syphilis in the secondary and tertiary period, as well as of ascertaining the effect of treatment and detecting latent syphilis, is by the sero-reaction of Wassermann, Neisser and Bruck, which is based upon the work of Bordet and Gengou on the deflection of the complement. Another important method of diagnosing syphilis is by means of Noguchi's Luetin. He says:

"The luetin produces a cutaneous reaction in syphilitic and para-

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syphilitic patients that is most constant and severe in the tertiary and hereditary affections. In my series of cases (400) it was present constantly (100 per cent.) in the manifest tertiary affection, in 94 per cent. of latent tertiary affection, and in 96 per cent. of the hereditary affection."

Sowade has applied the Abderhalden method to detect syphilis, and says he has obtained good results with it.

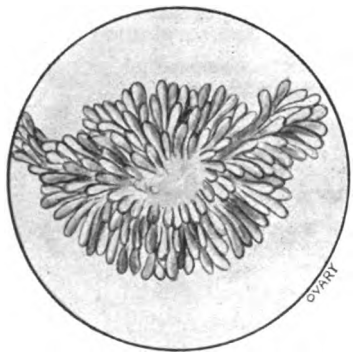


Fig. 48.

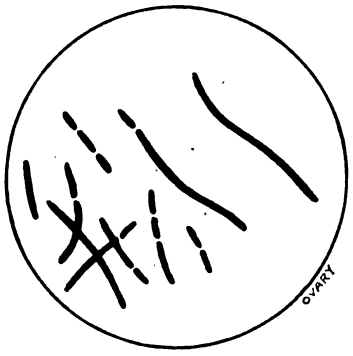


Fig. 49.

Fig. 48. Actinomyces Bovis in the Sputum of Man. (Modified from Kolle and Hetsch.)
Fig. 49. Leptothrix Buccalis. (Modified from Macé.) × 1200.

The Minute Micro-Organism of Epidemic Poliomyelitis.

Flexner asserts that the infection of Epidemic Poliomyelitis takes place through the nasopharynx, that the virus ascends probably from the mucous membrane of the nose by the lymphatics to the pia-arachnoid membranes and adjacent nervous structures, multiplies there, and later attacks the medulla and the cord.

The filterable nature of the causal agent of this disease was discovered independently by Flexner and Lewis, and Landsteiner and Levaditi.

Flexner and Noguchi (1913) have discovered the micro-organism (Fig. 47) causing this disease, which consists of globoid bodies, 0.15 to 0.3 of a micron in diameter arranged in pairs, chains and masses, according to the conditions of growth and multiplication. They say: "Regarding the cultivated minute but visible micro-organism itself, it may be held on the basis of the data presented that it fulfills the conditions hitherto demanded for the establishment of causal relation between an extraneous parasite and a specific disease. The micro-organism exists in the infections and diseased organs; it is not, so far as is known, a

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common saprophyte, nor associated with any other pathological condition; it is capable of reproducing, on inoculation, the experimental disease in monkeys, from which it can be recovered in pure culture." It, therefore, fulfills all the requirements of Koch's law.

Actinomyces Bovis.

The Actinomyces Bovis (Bollinger and Hartz) (Fig. 48) causes Actinomycosis, a disease in bovines characterized by the formation in the maxillary bones and tongue, of a hard sarcomatous-like tumor tending to form pus. Since the discovery of this organism in the pus of empyema in man by Bollinger, many other cases of actinomycosis in man have been observed. In man, besides the maxillary tumor, local or general lesions resembling and at times mistaken for those caused by the tubercle bacillus are met with. Actinomycosis of the lung (bronchopneumonia or pleurisy) and peritoneum are also seen. The clinical diagnosis is often difficult, and microscopical examination of the pus and sputum should always be made. The Actinomyces is said to live in a saprophytic condition on grain, especially barley, and thus it is that the infection of bovines is explained. The infection enters the body of cattle by the mouth, pharynx or upper part of the alimentary canal, the micro-organism passing into the tissues through some break in the mucous membrane. It is suggested that man may be infected by chewing grain, etc., or inhaling particles of threshed grain. Wright maintains that the Actinomyces is normally present in the mouth, and that the irritation, etc., occasioned by the foreign body (grain, etc.) facilitates the entrance of the fungus in the tissues. There seems to be some ground for incriminating the tonsils (pharyngeal, faucial, lingual) and carious teeth, as ready points for the actinomycetic infection.

Leptothrix Buccalis.

Suppurative lesions in the mouth and throat have been attributed to a saprophytic micro-organism of the buccal cavity, the Leptothrix Buccalis (Fig. 49).

Oidium Albicans.

The Oïdium Albicans (Fig. 50), the cause of Thrush or Parasitic Stomatitis, which is found almost constantly in the air, can grow in the buccal mucous membrane only when the saliva is altered through disease. This pathogenic yeast plant may invade the œsophagus, stomach, and at times the anus and vulvae. In exceptional cases it has passed into the blood and caused a general infection.

Saccharomyces Granulatus.

The Saccharomyces Granulatus has been found by Vullemin and Legrain in a tumor of the maxillary bone.

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Cryptococcus Linguae Pilosae.

The Cryptococcus Linguae Pilosae has been described by Lucet in severe cases of Black Tongue. Lucet failed to reproduce the lingual lesions experimentally. Gugeon has found the Oöspora lingualis associated with the Cryptococcus of Lucet.

Sporotrichum.

A number of observers (Schenk, Hektoen and Perkins, de Beurmann, Ramond and Matruchot) have described a disease principally characterized by

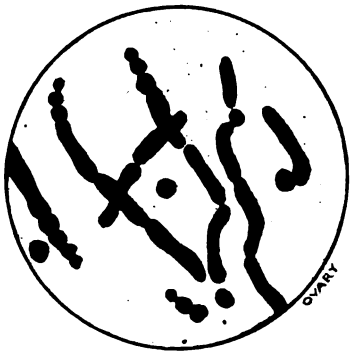


Fig. 50.

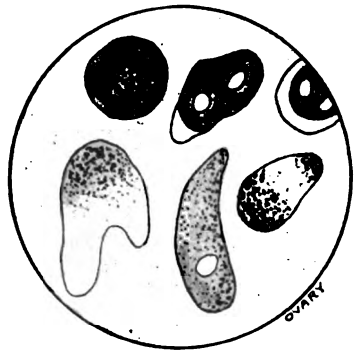


Fig. 51.

Fig. 50. Oidium Albicans. (Modified from Macé.) × 1000.
Fig. 51. Amœba Coli. œ × 400. (Modified from Neveu-Lemaire.)

stubborn subcutaneous abscesses or disseminated multiple gummata, which soften and disappear in five or six weeks. The lesions are said to be caused by a fungus named by Smith the Sporotrichum, which may attack the mucous membrane of the mouth, pharynx or larynx. It may produce gummata in muscles of mammary glands, a papular or vesicular dermatitis, osteitis, synovitis or adenitis.

Amoeba Buccalis.

To-day the Protozoa plays a great rôle in both human and veterinary pathology. Amoebae are frequently found in the human intestinal tract, and one species, Amoeba hystolica, causes in the tropic an endemic dysentery. Gross, Sternberg, Kartulis, von Prowazek, Dubar, Verdun and Flexner have proved the existence of an Amoeba variously called Amoeba Buccalis, Amoeba Gingivalis, Amoeba Maxillaris, Entomoeba Buccalis (von Prowazek) in ulcerations of the mouth and in tartar in carious teeth, in cancer of the mouth and in suppurations of the mandible. The pathogenesis of the Amoeba Buccalis is not known. It appears to resemble closely the Amoebi coli (Fig. 51), an inoffensive saprophytic micro-organism found in the upper part of the large intestine.

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An Invisible Micro-organism—The Virus of Rabies.

Remlinger and Rifat-Bey and others have proved that the Virus of Rabies or Hydrophobia can easily pass through the following filters, viz., Berkfeld V and W N and Chamberland F. The virus is contained in the saliva of infected subjects, and Nocard and Roux state that it is always found in the saliva of the dog twenty-four to forty-eight hours before the animal shows any signs of rabies. According to Zagarrio, the saliva of a dog may be infectious two weeks before the appearance of any symptoms of rabies.

The central nervous system (especially the medulla) of those infected with rabies always contains the virus. Bites upon parts of the body having a rich nerve supply, such as hands and face, are particularly dangerous. The so-called Negri bodies are always found in the large nerve cells in the cortex cerebri, cortex cerebelli, hippocampus major, and are few or absent in the pons varolii and medulla. Negri and many other investigators believe the bodies discovered by him are protozoon parasites. Remlinger maintains that an invisible micro-organism attacks the nerve cells, and, as a result, the Negri bodies are formed within them. Celli and de Blaschi think that the Negri bodies are evolution forms of smaller micro-organisms, which can pass through the filters and cause the infection and, increasing in size, appear later as these Negri bodies. The Negri bodies, however, are specific to rabies.

Noguchi claims to have cultivated the parasite of rabies, and says that in the cultures very minute granular and somewhat coarser pleomorphic chromatoid bodies arise which on subsequent transplantation reappear in the new cultures through many generations.

The Causal Agent of Acute Articular Rheumatism.

That the Streptococcus is the causal agent of articular rheumatism has not been proved (Kolle and Hetsch), for, though it can enter the blood and cause articular and cardiac lesions, it cannot from this be inferred that it is a causal agent of articular rheumatism, because the Meningococcus, Pneumococcus and the Bacillus of Friedländer can also cause these lesions. The Streptococcus is not always found in the articular exudates; ofter they are sterile.

The curative action of an anti-streptococcus serum upon a case of articular rheumatism is not upon the rheumatism, but upon the Streptococcus infection, which took place through the tonsils and which is a secondary infection occurring in many diseases, more especially in scarlatina, diphtheria and variola.

Henry has obtained pure cultures of the Diplococcus of Popoff and Walker from the blood in eight cases of acute articular rheumatism. He also found in their blood a specific antibody for this Diplococcus.

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Henry, Wassermann, Leyden, Payne and Paynter, Triboulet and Coryon believe this micro-organism to be the causal agent of acute articular rheumatism.

The protection of the organism from and the infection of the organism by pathogenic micro-organisms are not such simple things as they are sometimes represented to be.

Chapin says: "That a single germ will cause disease in a myth of the early days of bacteriology. Many germs are usually necessary, the number doubtless varying greatly with their virulence, with the species, with the nature of the disease process and with the mode of infection. . . . . It is not the mere presence of germs, but their quantity that counts."

It is extremely difficult to single out those micro-organisms in the mouth which are saprophytic, or pathogenic, or which may become pathogenic.

Saprophytic micro-organisms in the mouth of a healthy person may become pathogenic when the mucous membrane of the mouth is injured, or the secretion of saliva is interfered with, or in the presence of a general systemic disturbance, or when associated with other micro-organisms, etc., and cause buccal lesions of a more or less serious character. Exposure to cold, in the absence of any apparent infection, may lead to a streptococcus angina; an erupting tooth in an infant may be accompanied by a stomatitis, in the exudate of which a great number of the fusiform bacilli of Vincent are to be found.

Man is constantly swallowing all kinds of micro-organisms. At birth his possible sterile buccal cavity is contaminated by the micro-organisms in the air and in the normal secretions or pathological exudates of his mother's vagina and in his mother's or cows' milk, and he himself continues this contamination later in life by such a simple act as placing his fingers in his mouth, etc.

To protect oneself from "bacillus carriers" is by no means easy. They are not only a menace to themselves, but to all who may come into direct or indirect contact with them.

The mucous membrane of the cheeks is not a favorable site for the growth and development of micro-organisms, as they are being continually swept away by the saliva, but micro-organisms may develop in great numbers on the surface of the tongue between the papillae, at the gingivo-dental margins, between or upon the surfaces of the teeth, in the crypts of the lingual and faucial tonsils, and in the ducts of glands; micro-organisms have been found in Stenson's duct, but not in the parotid gland. Great numbers of micro-organisms are always found in the tartar on teeth.

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During sleep the defensive powers of the mouth are lowered, and the growth and development of micro-organisms are facilitated in the buccal cavity. On awakening the tongue may be dirty, coated, covered with epithelial débris, the breath is often disagreeable or fetid, and the contents of the mouth are often acid in reaction. In febrile diseases, when the salivary secretions are diminished, the breath becomes offensive, the contents of the mouth acid, and thus are favored the development of micro-organisms and the production of buccal lesions.

In the mouth the protective influences against pathogenic micro-organisms are provided by (1) the stratified squamous epithelium, which acts as a living coat of mail, of which the upper squamous cells are continually being desquamated and replaced by the younger cells beneath; the desquamated cells thus carrying away the micro-organisms which lie upon them; (2) the mechanical action of the saliva in washing out the mouth, especially during the movements of the tongue; (3) the phagocytic action of the leucocytes which wander between the stratified squamous epithelial cells, and which are found also upon the free surface of the buccal mucous membrane; (4) possibly the action of defensive ferments in the saliva which have a destructive action upon "the protein poison."

Vaughan and Wheeler (1903) have shown that the Bacillus coli communis and other pathogenic and non-pathogenic micro-organisms and animal and vegetable proteins contain a highly active poison—*"protein poison."* Micro-organisms are particulate proteins. No cell fails to give a protein reaction.

Abderhalden and his pupils have proved the formation and specificity of the defensive ferments in the animal organism, and Abderhalden says: "The fact that the animal organism replies to the invasion of disharmonious substances by means of specifically directed ferments, is of the greatest importance to physiology as well as to pathology."

Many facts accord with the suggestion that the leucocytes play a part in the production of defensive ferments, and Abderhalden says: "They (leucocytes) probably give off these ferments to the circulation. If so, we should then have in the blood plasma phenomena more or less analogous to those observed, for instance, by B. Friedrich Müller, during the dissolution of the fibrin that is excreted into the alveoli in cases of pneumonia. We see here numerous leucocytes penetrating into the solid exudate and dissolving it, after which an absorption of the products of decomposition begins, a kind of digestion taking place in the interior of the alveoli. Here, also, as can be shown by special experiments, ferments can be demonstrated in the contents of the alveoli (in the expectorated sputum); and these ferments take their origin from the

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leucocytes. The old view, whereby the leucocytes take up substances from the outside and digest them, must now be completed by the observation, that ferments can be given off to the exterior, and that therefore digestion may be accomplished outside the cell."

The morphological unit of an organism is the cell, the physiological unit is the protein molecule in the cell. Disease may occur without the presence of any micro-organism, because proteins which gain access to the blood, lymph and cells of the body and sensitize the cells, cause disease. Disease can be caused by the parenteral digestion of proteins. A foreign protein (particulate, in solution, alive or dead) getting into the blood or lymph of the body must be disposed of by parenteral digestion.

Hay fever is due to sensitization to the pollen of different plants. When peptone or finely divided proteins are inhaled inflammations of the upper air passages may result. Absorption from the alimentary tract of undigested or partly digested proteins may cause sensitization. Every living cell has not only extra-cellular ferments, which prepare the food for absorption by the cell, but probably also intra-cellular ferments which are engaged in the anabolism of the cell.

The pathogenicity of a micro-organism depends not only upon its capability of digesting and feeding upon the proteins in the cells of the host's body, and thus enabling it to grow and reproduce, but also upon the fact that the ferments of the cells of the host's body must not be immediately destructive to the invading micro-organism.

A pathogenic micro-organism grows and reproduces itself in its host's body by producing extra-cellular ferments which, acting upon the proteins of the host's cells, prepare them for absorption by the invading micro-organism and these absorbed proteins are built up into the protoplasm of the invading micro-organism by its intra-cellular ferments. During the incubation period of a disease, there are no symptoms, although the invading micro-organism is actively growing and reproducing itself in great numbers at the expense of its host's proteins. At this time the micro-organism produces the ferment, the proteins of the host are the substrate, the process is constructive, so far as the invading micro-organism is concerned, and no protein poison is liberated.

At the expiration of the period of incubation of the disease the symptoms appear. The cells of the host have become sensitized to the foreign protein and form a specific ferment in order to digest the protein of the pathogenic micro-organism.

The invading micro-organism is now the substrate for the ferment of the host's cells and the process is destructive to the invading micro-organism; it then liberates the protein poison and the symptoms of the disease are manifested.

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Vaughan states: "Of all the bacteria with which we have worked the Bacillus prodigiosus yields the largest amount of the protein poison, but this organism is not pathogenic to man or laboratory animals because it cannot grow and multiply in the animal body. On the other hand, the anthrax bacillus yields a relatively small amount of the protein poison, and yet it is one of the most infectious organisms because it can grow and multiply in the animal body."

Abderhalden asks the question: "May it not be that immunity partly rests upon the fact that an organism is able to set free its defensive ferments quicker than usual?"

Disease may be transmitted to some extent by dust and mouth spray, but to a much greater extent by direct and indirect contact. All persons are not clean.

The greatest prophylaxis must be through personal cleanliness.

"It is usually comparatively simple," Chapin says, "so to live as not to allow the secretions of others to come in contact with one's own mucous surfaces, and it is easy, and should be considered immoral, to allow one's own secretions to be so placed that they may infect another."

The immorality of so endangering another's health was perhaps in Carlyle's mind when he said: "Regard health as the real equilibrium and center of things. You should always look at the *heilig*, which means *holy* as well as *healthy*." Such a universal regard for health will go far toward what Bacon called "the establishing of the kingdom of man."

I am indebted to Dr. Francis O'vary for the drawings of the cuts with the exception of Figs. 44 and 48.

Dentistry in Brazil.

By W. J. Frost, D.D.S., Emmetsburg, Iowa

A recent report by one of the New York papers that dental clinics have been established in every public school building in Rio de Janeiro challenges the attention of thoughtful dentists everywhere. The announcement is all the more startling because it eminates from a land where dentistry in general is so crude that its practitioners barely enjoy the dignity of a profession, and the degree of Doctor of Dental Surgery has never been conferred.

Yet Brazil is a great country. Geographically it is by far the

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largest of South America, and it is equal in size to the United States with Texas measured twice. Only last October the Pan-American Dental Congress was held in Rio with the president of the Republic as patron. It was an event worth traversing oceans to attend, for Rio is one of the most beautiful cities in the world. Stately Royal palms, planted by Emperor Dom Pedro I. over a century ago, adorn the *Jardim Botanico,* reaching skyward like tropical giants; and the magnificent bay harbors the mighty ships of every flag that floats.

Washington Irving, in his delightful sketches of rural life in England, reminds us that the stranger who would form a correct opinion of the English character, must not confine his observations to the metropolis. The same general principle applies when a foreigner ventures to describe conditions in Brazil. "He must go forth into the country, he must sojourn in villages and hamlets; he must visit castles, villas, farm-houses, cottages; he must wander through parks and gardens; along hedges and green lanes; he must loiter about country churches; attend wakes and fairs, and other rural festivals; and cope with the people in all their conditions, and all their habits and manners."

So it was my privilege to see Brazil and the Brazilians. Fortified with a signed contract by the Secretary of the Interior I proceeded to my destination at the terminus of the Brazilian Central Railway, some fourteen hours inland from Rio. Not far from here was Ouro Preto, the birthplace of Tiradentes the first martyr for Brazilian independence.

Tiradentes, as the name would imply, was a dentist—literally *tooth-puller.* He was a lieutenant of militia when apprehended on a charge of treason. With some fellow conspirators he was found guilty, drawn and quartered, and his head placed over the gate of his native city, a fearful and ghastly warning to conspirators against the Empire for all time.

Tiradentes has been dead more than a hundred years, yet dentistry in Ouro Preto has made but little progress to this day. Dental offices are unknown, and the unfortunate victim of *dor de dente* must either patronize the local barber or endure his affliction in silence.

Nor is dentistry among the natives in other parts of Brazil outside of the large cities in any more flourishing condition. At the American college in Juiz de Fora, with which I was for a time connected, the dental students are obliged to patronize the local barber to obtain teeth for prosthetic purposes. And while much emphasis is placed on the theoretical branches, the dental course is far inferior to the curriculum prescribed in the United States. The course covers but two years and the seniors or second-year students spend but two hours a day in the infirmary. A live American student could easily do the work of four

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natives; and the first year's laboratory course requires the taking of an impression, making a base plate, one Davis crown, and one shell crown. Out of eight teachers on the staff but two are dentists.

Fees.

As might be expected in a country where the standard is so low, the American dentists practicing in Brazil are immensely popular. They are to be found only in the large cities, and demand fees which in this country would be considered fabulous. For instance, I am personally acquainted with a dentist in the capital who receives for his services fifty mil reis (about seventeen dollars gold) per hour, in advance. An unlicensed American dentist in his employ gets thirty mil reis an hour. Even estimating living expenses at twenty per cent. more than they are in the States, it may readily be computed that our *Dentista Americano* has a veritable bonanza.

License Requirements.

The mention of generous fees and abundant practice naturally leads to a consideration of the qualifications for practice. Strictly speaking, there is no such thing as a State board in South America. Instead, the candidate for license to practice in Brazil must defend a thesis, written in the Portuguese language. If successful, he is entitled to practice in any of the twenty-one States. Outside of the fact that a comprehensive knowledge of the language is an essential requisite, the examination is nothing to fear. No operative procedure of any nature is required.

Should any of my brother dentists in this country be enticed, however, to locate beyond the Equator, I would earnestly advise him to weigh seriously the advantages and the disadvantages. In a general way the American dentist practicing in another country enjoys the distinction of being in a class by himself And this is especially true of American dentists in Brazil. The men who have gone before have been, with hardly an exception, "workmen that needeth not to be ashamed." Electricity is abundant and cheap; for Brazil is rich in natural water-power. There are no coal bills to pay, and the hiss of the steam-pipe is never heard. Summer, like its rivers, goes on forever.

Customs of Brazilians.

Among the disadvantages might be mentioned a few of the disparaging features that cause the energetic foreigner to curse the day he set foot on Brazilian soil. The natives are exceedingly procrastinating, and it is next to impossible to get anything done in a hurry. A very popular phrase is *"Amanha, si Deus quizer"—To-morrow, if God wills.* It is exasperating to hear people talk and laugh when you do not know what they are talking about and you cannot see the joke. Yet unless

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you have a pretty general smattering of Spanish it will be months before you can do either. There are strange customs and queer habits, at utter variance with anything you ever knew before. Then there is the consciousness of being expatriated in a foreign land beneath strange stars. If these inconveniences can in a measure be overcome, then Brazil offers opportunities to the American dentist that are second to none. Let no one, however, presume to revolutionize existing conditions. Time and again, as I observed conditions beneath the Southern Cross I thought of what Kipling put into verse about India, but which is equally appropriate to South America:

"Now it is good for the Christian's health
To hustle the Aryan brown;
For the Christian riles
And the Aryan smiles,
And he weareth the Christian down.
And the end of the fight
Is a tombstone white
With the name of the late deceased,
And the epitaph drear,
"A fool lies here
Who tried to hustle the East."

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Amalgam and Its Phases.

By W. G. CRANDALL, D.D.S., Spencer, Iowa.

Read before the Union Meeting of the Third and Fourth District Dental Societies, at Schenectady, N. Y., October, 1913.

(*Continued from July issue of* ITEMS OF INTEREST.

Failure from the Use of Unbalanced Alloys.

The term "Balanced alloy" signifies an alloy which when amalgamated will not show shrinkage or expansion. That is, the movement in one element or group of elements is exactly overcome by an opposite movement in another element or group of elements. To understand these conditions we must make a study of the metals commonly used in alloys, and the process of alloying.

The metals that have been used to any extent in dental alloys are silver, tin, copper, zinc, and gold. Many others have been tried but are not used to any extent.

Silver.

Silver is the element of strength in all alloys. It increases in volume when amalgamated. It increases strength and lessens flow, and because of its affinity for mercury when properly exposed, it hastens setting. It tarnishes in sulphureted hydrogen and soluble sulphides. It causes the mass to work hard.

Tin.

Tin unites with mercury in all proportions forming a weak crystaline compound. It retards setting, decreases in volume when amalgamated, decreases edge strength, increases flow and produces an easily worked mass.

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Copper. Copper unites with mercury with great difficulty at ordinary temperatures, it increases the strength when used in not to exceed five per cent., decreases flow, does not contract nor expand, and is easily tarnished.

Zinc. Zinc used in sufficient quantity it is claimed will aid amalgamation. Dr. Black, after years of careful observation of the effect of various modifying metals, says: "Experiments in watching fillings for five years show also that one-half per cent. of zinc is inadmissible, for the reason that the amalgam will continue to change bulk very slowly for that time and perhaps much longer. Though this change is not large (not more than one to one and one-half points per year with one per cent. of zinc), it will finally destroy the usefulness of the filling. This effect was so subtle that it was not at first discovered."

Gold. Gold adds no desirable properties in any proportion. It causes amalgam to be springy and difficult to pack.

There are in common use to-day two distinct classes of alloys. First, a low per cent. silver alloy which has easy working qualities, amalgamates easily, packs easily, has good color, shrinks and flows badly, and sets very slowly. These alloys are made because there is a demand for them. They are used because there is no *difficulty* in using them, and they have a very good appearance for a time. These alloys contain from 43 to 60 per cent. silver, 40 to 58 per cent. tin, and 1 to 5 per cent. zinc.

The second class is known as "Black alloys," "high per cent. silver alloys," or "quick setting alloys," the three names being synonymous. They contain from 65 to 75 per cent. silver, tin and sometimes copper and zinc. They are quick setting, work rather hard, require more mercury, and are supposed to be tested so as not to shrink but to expand very slightly, and flow but very little under ordinary conditions. The basic idea in what are known as Black alloys is that metals are dissolved in each other in such proportions, that movement in one will exactly counterbalance movement in the other.

Methods of Manufacture. The value of the amalgam alloys depends very largely on the manufacturing process. This would include the manner and method of melting the metals, temperature at which they are melted, time they are kept molten, the thoroughness of the solution, the temperature at which they are cast, and the rapidity of cooling. The electric furnace is used for this purpose and is devised with a thermostat and accurately controlling

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reostats. This is kept surrounded by hydrogen gas, and the lower fusing metal is first brought to solution. The higher fusing metals will dissolve quite readily in the lower fusing metals with a very slight increase in the fusing point. Great care and skill are required in this process to produce a perfect solution. There are frequently formed in alloys that have been overheated, what are known as eutecticons. In these eutecticons two or more metals have formed a mass differing in percentage to the metals as originally intended for the alloy. This may be observed by melting an alloy ingot, when the difference in the fusing point of the different alloys may be observed. If there are no eutecticons, the entire mass will melt at one degree of heat. If eutecticons are present, the lower fusing alloy will become fluid at a certain temperature, and particles of a higher fusing alloy will be observed afloat in the solution.

A similar occurrence may be observed in the freezing process of salt water; although the salt may be in perfect solution in the water, the first ice formed will be observed to contain a smaller proportion of salt than will be found in the water.

It is essential that alloys should be formed in as perfect solution as possible. Where the solution is not perfect and contains such eutecticons as I have described, the working qualities of the alloy must vary in proportion to the variation of the metals in the separate alloys found. If a portion of the alloy used in a certain filling chanced to contain a large proportion of silver, it would be found to produce a filling difficult to amalgamate, would expand badly, and require a large amount of mercury. Or, if another contained an excess proportion of tin, it would amalgamate very easily, take up less mercury, and would shrink and flow badly. Such uneven solutions are not permissible in our endeavor to obtain a perfectly balanced alloy. After the pouring and cooling of the alloy, the filing should be done very slowly, so as not to produce heat and cause an uneven tempering of the alloy.

Tempering or Ageing of Amalgam.

It has long been known that alloys undergo a change after being fully prepared for use. This change is known as tempering, or ageing. It is not an oxidation nor a chemical process in any respect, but purely a physical phenomena and one which I will not attempt to explain. It might be illustrated as similar to that of the barber's razor, which at times gets out of sorts, and the barber says, "it needs a rest." This sounds, indeed, very odd to us, but the rest seems to produce the desired result. Ageing is in some way an adjustment of molecular form, which has been mal-adjusted by the heating and cooling process.

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Ageing is essential in an alloy for three reasons. First, an alloy that would be properly balanced the day it were made and with which a perfectly balanced filling might be made that day, would age so rapidly, unless kept in a very cold place, that fillings made with it a few days later would shrink. Second, they are so quick setting that it is almost impossible to manipulate them. Third, it requires too large a proportion of mercury to bring about a good amalgamation.

Ageing may be brought about by permitting an alloy to stand in the ordinary room temperature for several months, or by the application of a low degree of heat for several hours, or by being heated to the boiling point of water for about fifteen minutes. The ageing by time at ordinary temperature is too indefinite and slow to be considered. The application of a definite degree of heat for a definite time gives us better control of the alloy.

The ageing process is a softening process. It will cause an expanding alloy to expand less, a shrinking alloy to shrink more. It tends to reduce the strength and to increase the flow. It makes easier the amalgamating process.

An alloy that has been properly annealed will continue to anneal at ordinary room temperature. The effect of this continued ageing does not cause the alloy to shrink more. Such an alloy will require less mercury for amalgamation, will work easier, and authorities seem to agree, that it causes continued loss of strength and a continued increase in flow. It will also set much slower.

Because of the effect of continued annealing, an alloy becomes quite unfit for use one year after its manufacture. And because of this, dentists should have some means of knowing the age of the alloy they are buying. They should not purchase in quantities larger than they can use within a year.

The stage of annealing in which no further shrinkage appears, Dr. Black has termed the zero point of annealing. A balanced alloy annealed to this point is rather quick setting; if continued past this point, setting is slower. Therefore, any first-class alloy must be rather quick setting.

The fineness of the cut of alloy has its effect on the setting qualities of an alloy. Because of the additional surface exposed the smaller the filing the more surface of alloy will be exposed to the action of the mercury, giving opportunity for greater mercury absorption and causing quicker setting.

To produce a balanced alloy with commercial silver and tin is a very delicate process, requiring many tests and accurate measurements with the micrometer. The point at which this balance is found varies

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from 72 to 75 per cent. of silver. If it were possible to use chemically pure silver and tin, a definite formula could be established but different lots of commercial silver and tin vary in their properties, so that it is necessary to form a balance with every lot of metals used.

A variation of one-fourth per cent. might produce a shrinkage sufficient to destroy the value of the fillings. If the balance point is missed 1/25000 of an inch and this amount of shrinkage would take place about the margin of the filling, the value of our alloy may be seriously doubted. There is no other way known of obtaining a balance except that devised by Dr. Black, which requires very close measuring, together with the most accurate technique in making. Therefore, we may conclude that the alloy manufacturer, no matter how skilful he may be, cannot make a perfect alloy without the aid of accurate instruments with which he can detect and control the movements in an amalgam while setting.

Dr. McCauley says: "The practice of following a set formula for manufacturing an alloy is pernicious and should not be tolerated by the dental profession."

Evil Results of Shrinkage of Amalgam.

The effect of shrinkage of amalgam fillings is discoloration and recurrence of decay. Shrinkage of one point as shown by the micrometer measurement may produce a ditch between the filling and cavity wall as wide as a ten-thousandth of an inch. The micro-organism which produces caries measures from four-tenths to eight-tenths of a micron. The micron is a thousandth of a millimeter, or 1/25000 of an inch. The micro-organism measures from 1/65000 to 1/32500 of an inch and a few figures will reveal the fact that one point of shrinkage will open up a passage sufficient to admit three to six of these little offenders side by side. Even less than one point of shrinkage will admit micro-organisms and decay may begin again where the cavity margins cross a susceptible line. Now the question arises, "what should be done with the vast number of commercial amalgams which shrink from one to fifteen, and even twenty points?"

Amalgam Micrometer.

I have had built a micrometer more simple in construction than that built by Dr. Black, and, I believe, many times more accurate. In this micrometer there are but few movable parts and only one of these could possibly be inaccurate. The unit of measurement which I use is the micron (1/25000 inch). It would be possible with this instrument to make the unit of measurement as fine as 1/100000 inch, and we may some time care for that kind of a reading. The first amalgam

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micrometer was built by Dr. Hitchcock, of New York, and the unit of measurement was 1/1000 inch. Very unfortunately for the profession Dr. Hitchcock died before his work was completed. Dr. Black constructed his micrometer along much the same lines, but found the measurements should be more delicate; he established the unit of measurement at 1/10000 inch, and speaks of this as one point. My experiments convinced me that most micrometers of the Black type were not sufficiently accurate, or, the reading was not as fine as it should be. The Black micrometer is built on the rack and pinion principle and is moved by a fine chain; there are so many moving parts that for very delicate reading there is too much lost motion. The instrument has been of inestimable value to us. Greater accuracy is an advantage in that we can detect the more minute movements of the amalgam, and be more certain of a balance. In fact, after working with this instrument, I became convinced that many alloys that had seemed to show a balance by careful tests were unfit for use.

When Dr. Black made an examination of the dental alloys in use in 1894, he found that they all showed shrinkage. The manufacturers were not to blame, for they were ignorant of the value of their materials. In 1912 Dr. McCauley reported a number of tests before the N. D. A. He does not regard his tests as conclusive, especially as he was unable to get samples of all the alloys used in this country, and there were not sufficient tests made of each alloy. Out of the large number which he did test, he was compelled to eliminate as unsafe to use all but five, and these five were subjects for further examination. The results of Dr. McCauley's tests show a large percentage of alloys to have excessive expansion. Many had both excessive shrinkage and expansion. All this. Seventeen years after Dr. Black had published his findings on the manufacture and testing of alloys, shows a lamentable state of carelessness, both upon the part of the manufacturer and the profession. And, of the two, I believe the profession is more to blame. When we demand accurately made alloys, we will get them, but as long as a majority of the profession prefer and use the velvety, easy working alloys, it is too much to expect the manufacturer to go to the trouble and expense of changing his methods. We all like too well the easy way.

Speaking accurately, there are no alloys which are perfectly balanced, at least, I have never been able to find one. The best we can hope for at present is an alloy which when well amalgamated, and after having the setting changes take place, will show a slight expansion. Fifteen microns expansion is none too great. Any alloy which will show only a minimum expansion will first have some shrinkage.

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Methods of Testing Amalgam.

It might be of some interest to you to know how these tests are made. It is first determined what proportion of mercury is necessary to make a good amalgamation. The larger the amount of alloy used, the larger the ratio of mercury must be, because of the fact that we cannot have the advantage of thorough grinding and manipulation with the larger masses. It usually requires about sixty grains of alloy for the micrometer tests. The amalgam is manipulated as nearly as possible the same as we would have it if packed in a cavity. The cavities we use are the well-known Wedelstaedt tubes. The cavity is cylindrical in form eight by eight millimeters, cut in a steel cylinder, one inch in diameter by one-half inch in depth. The strength of this tube is such that it will resit the strong expansive force of any amalgam, causing it to protrude from the cavity. As soon as the amalgam is packed into the cavity, we use a straight edge knife and plane off the excess. The object of this is to make all fillings as near the same size as possible. We then place a smooth metallic touch point at the center of surface of the filling, using a fine short tack for this purpose. The tube is then immediately placed in the micrometer. The arrangement is such that it will only go in in one position, and the measurement takes place at one exact point. The measurement of the filling is made as soon as is possible. I have seen published reports of these tests when the first reading was not made until the filling had been made fifteen minutes. This would be a good method with which to bolster up the reputation of a shrinking alloy. The object of testing the amalgam is to know just what movement takes place and as shrinkage always takes place first and very quickly, we should record every movement the same as it would occur in a filling in a human tooth.

A record is made of the number of the tube, the kind and condition of the alloy, the number of grains of alloy and mercury, how they amalgamate, amount of excess mercury, if any, the setting qualities, and any other data that is of interest to the test. The day, hour, and minute of each reading is recorded opposite the reading. Readings are made every minute as long as movement occurs. The best balanced alloy will usually show a shrinkage of from three to five microns during the first five or ten minutes, and then expansion will begin and should overcome any shrinkage within thirty minutes, often in much less time. I should regard as dangerous any amalgam that shows a shrinkage in excess of eight microns, or expansion above thirty microns. There is some question as to this small primary shrinkage being true shrinkage. It is not discernable at the margins under the microscope. I cannot prove it, but feel quite certain that this very slight movement is a surface absorption of

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mercury and possibly a dropping of the center of the surface and rounding of the angles, that we observe in the congealing of any metal. My observations led me to believe that this dual movement is closely related to incomplete alloying, as it diminishes perceptably in those alloys which are carefully made. In considering these movements, you must keep in mind that these figures represent a very small and accurate movement, in fact, so small that they have never to my knowledge before been recorded or reported. Also that ten microns shrinkage represents a great deal more movement than would ten microns expansion. On account of the way these tubes are constructed, expansion must occur only in one direction, and we measure it all in that direction, while shrinkage is from all surfaces toward the center of the filling, and we can record it only upon one surface. I know of no scheme whereby a micrometer can accurately record shrinkage in the same ratio as it records expansion, neither do I know of any reason why it should. Any amount of shrinkage is so dangerous, that the minutest suggestion of it should warn us of its dangers, that we may flee from them. It may occur to you as strange, why the best balanced alloys should first shrink and then expand. I would remind you that alloys are solutions of principally tin and silver.

Tin amalgamates readily and always shrinks. Silver amalgamates slowly and expands, therefore, the mercury takes up the tin first, causing shrinkage, but later the silver, with its slow and determined affinity for mercury, becomes better amalgamated, possibly taking away from the tin some of the mercury it had absorbed. And if the silver is in proper proportion in the alloy, it will show an expansion. In manufacturing balanced alloys, sample alloys are made from the lot of metals to be used. If more expansion is desired, silver is added. If expansion is too great, the tin ratio is increased. In this means, a satisfactory balance is worked out for the metals to be used and for the metals tested only. Using chemically pure metals a fixed formula could be used, but the price for chemically pure metals is prohibitive for alloy making. Commercial silver and tin of very great fineness is to be had, but it is necessary to work up a balance with each change of metals. If the alloy manufacturer is very particular about his product, he should make frequent tests of the alloy as it is being manufactured, for even with the greatest care, a change in the behavior of the alloy may take place.

The best of alloys will not produce good results without intelligent manipulation. I realize that I am about to contradict a most eminent authority when I make this statement, but I am thoroughly convinced from repeated experiments, that the amount of excess mercury does have a very decided action on contraction and expansion. From a scientific point of view it is only reasonable that if mercury will cause tin

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amalgam to shrink, and silver amalgam to expand, an excess of mercury must produce more and longer continued movement than a minimum amount of mercury, and this is just what it does. A shrinking amalgam will shrink more with an excess of mercury, than when worked very dry. An expanding amalgam will show greater expansion with a large excess of mercury than when worked dry. A balanced alloy will show greater primary shrinkage and greater expansion with an excess of mercury.

Fillings made from well balanced and correctly annealed alloys should maintain perfect margins. If it maintains perfect margins, it has no superior as a tooth-saving material. It is possible to make perfect amalgam fillings, and is not particularly difficult. It does require a careful technique, but nothing that any dentist cannot master. The day is fast approaching when our patients will not countenance poorly shaped, ill-finished fillings with a black ditch about the entire margin, and the best thing that can happen to the dental profession is such an education of the public. Another advantage in the use of balanced alloys is that there is no discoloration of the dentine from such amalgam. Just so long as air and moisture are excluded from the tooth, there can be no change in color, for it is only by contact with the compounds of sulphur that the discoloration can take place.

Tests of Leaking Fillings.

With the desire to know something more of the action and appearance of leaking fillings, I have made an air-pressure appliance somewhat similar to that suggested by Dr. Southwell, of Milwaukee. This appliance is very simple, consisting of a pressure tank with pump and gauge. The air is conducted from the tank to four taps onto which the steel cavities with test fillings are screwed and immersed in water for the test. The cavities are made in steel and I have two forms: one is a simple round cavity, the other is made to represent a proximo-occlusal cavity similar to what we might find in molars. The walls are exactly parallel, and there is no bevel to the margin. They are so made that some part of the seat of the cavity consists of the flat end of a screw, that is to be removed when the filling is completed, so that the cavity may be placed upon the testing appliance for the pressure test.

To make the tests, the fillings should be placed in a glass dish of very clear water, so that they may be seen from all sides. The air pumping should be begun very slowly, that the margins of all the fillings may be carefully watched for bubbles of air that may begin to leak at a very low pressure. Indeed, it is surprising how little pressure is required to cause air to pass about the great majority of fillings. Of 110 fillings made and tested by this appliance, 42 resisted to exceed two

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pounds pressure without leaking air about the margins. All the balance leaked at from a few ounces to two pounds. A very few fillings failed to leak at the maximum pressure of 45 pounds. A large number leaked at so low a pressure that the gauge would not register. Twenty-six different operators took part in these tests and it is quite unnecessary to say, that they all did their best. There were twenty-three different alloys used, and I have used every effort to test out those that were the best known and most popular. I feel safe in saying that of this number of alloys not to exceed three are well enough balanced to make a perfectly and permanently tight filling. If a few ounces pressure will cause a violent leakage of air about the margins of a filling, we have no reason to believe that such a filling in human teeth would resist the ingress of moisture and bacteria under such air pressure as might be exerted in the human mouth, or under the pressure in the act of chewing certain hard and sticky foods.

No doubt we all have had our attention called to these conditions, when our patients have complained to us, that certain teeth which have recently been filled with amalgam, caused pain when in the act of eating sweet food. We have dismissed such patients with different excuses, but with the thought in our minds that the trouble was all an unbalanced condition of the patient's mentality, when, in fact, the trouble was all caused by the unbalanced condition of the alloy filling. This state of affairs is, indeed, a calamitous one and the attention of the profession should be given to its immediate correction.

This air-pressure test I believe to be practical as a test for good adaptation, and as a possible proof of the accurate balance of the alloy used. It would be of very little use in producing a balanced alloy.

Discoloration of Amalgam.

The further dangers of a shrinking filling are shown in the causes of discoloration. Dr. Adolph Witzel has demonstrated in his work that it is quite impossible for a tooth to discolor from a filling that does not leak. A filling which will exclude moisture and sulphureted hydrogen, which is so frequently found in the mouth, has no means of discoloration. Therefore, the only opportunity for discoloration must come from the leaking of the amalgam. The discoloration of the tooth substance is something separate and apart from the discoloration of the exposed part of the amalgam filling, the filling we expect to discolor. We know from experience that it is possible to have shrinkage, leakage, and discoloration without having a recurrence of decay. The effect of the oxides and sulphides seem to have a preserving effect upon the tooth tissue, and unless the margins fall within an area of susceptibility, there may not be decay in years.

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The discoloration of the amalgams *per se* vary with the compositions of the alloy. Those alloys that contain copper in considerable proportions are usually acted upon by the sulfids, and a deep black is the result; other colors, such as green and blue-green are occasionally produced. Those alloys in most thorough solution will maintain the best color when amalgamated. Because of the danger of these discolorations, amalgams cannot become suitable for fillings in the anterior portions of the mouth.

Strength of Amalgam.

The strength of amalgam is next in importance to that of shrinkage, and has its dependence upon many factors. Curiously enough, the greatest strength and freedom from flow of a silver-tin alloy is found at or very near the point of balance. This almost seems to have been divined for our advantage. We find that the greater proportion of silver under 75 per cent. will produce the stronger amalgam. When the proportion exceeds this, a loss of strength and toughness is observed, and the filling becomes more brittle. I have been able to make a filling of cylindrical form five by five millimeters, which when only one day old withstood a pressure exceeding one ton, and under 400 pounds pressure for three and one-half hours showed a flow of but two per cent. It is but reasonable to expect that such a filling would have great edge strength, although the toughness of gold is not expected. Such strength is far in excess of that of human dentine.

If five per cent. of copper be added to the alloy, displacing that amount of silver, the strength of the alloy will be increased about twenty per cent.

The strength will be greatly influenced by the method of mixing and packing. The strongest amalgam will be produced by a thorough grinding and mixing with the proper amount of mercury. Either too little or too much mercury will decrease the strength, also a failure of sufficient kneading will cause a loss of strength. Strength depends very largely upon the actual union of the mercury with the alloy. If the union is not sufficient, the amalgam will be brittle, if there is a surplus of mercury, the mass will be soft and lack strength. Strength is also modified by the age or ageing process of the alloy, an over-aged alloy is weak. Dr. Black has demonstrated that alloys continue to lose their strength standing at ordinary room temperature for over twelve years. Old alloys are not fit for use.

Effects of Flow of Amalgam.

When we speak of flow of amalgam, we mean the gradual movement under pressure, either sustained or intermittent. I consider the flow of amalgam a greater danger than poor strength.

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The overhanging margins of amalgam that you no doubt remember having seen very often, are not generally the results of expansion, but are either flow or an unfinished filling. When a filling flows from a cavity, it is not a process of increasing bulk, but of changing form, and consequently, there must be leakage at some portion of the cavity surface.

Dr. Black says: "An amalgam made of an alloy of tin and silver will have this property of flow in proportion to the tin it contains. If we subject pure silver, say a block one-tenth inch square to three hundred pounds, it will yield a very little almost immediately the pressure is applied, then it will yield no more until the weight is increased. If we try a similar block of tin in the same way, we find it softer. It will yield sharply at twenty-five pounds, and if we leave it under this pressure without increasing it, it will continue to yield until it has all crawled out between the points, or has been reduced to a thin sheet. Any amalgam that will flow under a pressure of fifty pounds, becomes unfit for filling teeth on account of this flow. Every stress of that degree would move it a little and it would soon be destroyed."

Some alloys of a distinctly granular character resist flow better than those of a smoother nature. "The difference in the rate of flow between different metals depends upon their plasticity, by virtue of which they yield to the pressure and allow the molecules to slip over each other and assume new positions." To make amalgam of great strength we should follow the example of the builders of great structures. I think amalgam should partake of the nature of concrete. When the builder wishes to get the greatest strength from concrete, he uses crushed rock or sharp sand, as his unit of strength.

He uses just enough cement to fill the space between his units of strength, and just sufficient water to fill the minute spaces that still exist between small particles of cement. This produces one of the most resistant masses known to science. In a way our amalgam structure is of the same nature. Mercury dissolves out sufficient tin and silver from our granules to fill in the spaces and form a solid mass. The strength of the mass depends upon the accuracy of the manipulation and the qualities of those granules.

Strength.

Strength can also be increased up to a certain point by thorough condensation. Just recently I made up a number of fillings to test the effect of heavy condensation. Fillings for these tests are made in steel cavities which form 85/1000 inch cube. I used seven parts alloy and eight parts mercury; this was thoroughly ground in the mortar and mixed in the palm and the excess mercury squeezed out through chamois. The amalgam was packed in the cavities with heavy mallet force. At varying

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intervals six of these fillings were crushed in the dynamometer. Their average crushing strength was 514 pounds.

At about the same time I made the same number of fillings, using the same alloy with the same percentage of mercury, ground in exactly the same manner, but the excess mercury was removed by pressure between the thumb and finger. These fillings were condensed with ordinary hand pressure. They were crushed in the same manner and at the same age as the other fillings, and their average crushing strength was 385 pounds, or, a gain in strength of 129 pounds or 133½ per cent. in favor of heavy mallet force, and a minimum of mercury. The amount of mercury can be reduced to a point when the mass will not be held in a strong united form. But this is not one of the common errors. Most amalgam is manipulated as a sloppy paste and crowded into the cavity with a ball of cotton, ball burnishers, and troweled up at the margins with any convenient instrument, after which the filling is given a brilliant polish, with a strip of rubber dam. Is it not to the credit of amalgam that it will live through such abuse?

Methods of Amalgamation.

The methods of amalgamation are various. Many men attribute their success with amalgam to their particular method of amalgamation. There are those that use a rubber finger stall or a piece of rubber dam; some do their mixing in the palm; others wash their alloy in weak acids, alcohol or ether, and amalgamate the fillings while wet, and there are still many other methods. I find by experiment that they may all be right, so much depends upon the alloy they are using, what method they must pursue to amalgamate it. To-day we are confining ourselves to a consideration of the high percentage silver alloys. Experiments and experience show that it is best that they should be first thoroughly ground in the mortar. The time required will vary according to the amount of alloy we are mixing, the percentage of mercury we have with it, and the pressure and speed with which we work. It should usually require from one to three minutes to accomplish this part of the work. The mass should be thoroughly ground for some time after it appears to be smooth, and then removed to the hand for thorough kneading or rolling. If at this stage there appears to be an excess of mercury, such as to make the mass sloppy and not capable of being well worked, this excess should be squeezed out between the thumb and finger and the kneading continued. This process requires about the same length of time as the grinding process. If the mercury has been kept down to the proper stage, soon after the mass has become thoroughly smooth and plastic, it will begin to stiffen and show signs of setting, when it should be immediately introduced into the cavity. It is important that the mass should

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be of the right consistency, and the correctness of this consistency depends upon the operator's ability to pack the amalgam perfectly to place. If the mass is too soft, it will be jelly-like, and tend to spheroid and draw away from the walls. Such a filling would be worthless; it would not be tight, would flow badly, and lack in strength.

I have been able to prove that it is possible to make the strongest filling with amalgam that is worked very dry. Yet while this is possible, I warn you that it is very difficult to get perfect adaptation and condensation with such amalgam. The amalgam should at all times be sufficiently plastic to admit of its being perfectly adapted to the cavity, and all mercury in excess of this should be removed. An excess of mercury is dangerous to the success of our filling. Amalgamation is not a chemical change, and mercury in amalgam is the same as mercury in a thermometer or any other place. If there is an excess, it will be driven back and forth in the alloy granules as it is affected by thermal changes, and a subsequent effect will be produced in the strength of the amalgam. Too much mercury diminishes the strength rapidly; too little mercury will cause the amalgam to be brittle and will prevent perfect adaptation.

The ratio of alloy to mercury should be determined for each lot of alloy and properly weighed before mixing, although the effect of removing any excess of mercury is not very serious, it is a safer plan to have about the right quantity. I find that it is seldom necessary with any alloy to use more than six parts of mercury with five parts of alloy, and then there is usually an excess of mercury to be removed.

I wish to warn you that those qualities in an alloy that are generally regarded as easy manipulation are most surely opposed to good results. The predominance of the metals that make manipulation easy do not produce the best and most permanent fillings.

Finishing Fillings.

There are two points I must briefly emphasize before closing this already over-long paper. Complete your operation by thoroughly trimming all margins flush, and thoroughly and carefully polishing the filling the same as you would polish a gold filling, of which you were proud. It will be better for the tooth, the patient and the dentist's reputation. Anything that is worth doing is worth doing well, and one could not be justly proud of an amalgam operation unfinished. And last, have the courage and manhood to demand a fee which will be a fair compensation for the good you have done. If you do not get such a fee you will surely hesitate to do your best and improve on your operations in the future. There is no filling material with which we can do as much permanent service for our patients in a given time as with amalgam. Is it fair to the patient to give him just an ordinary amalgam filling for, say

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one dollar, which might last a few years, when his teeth might be permanently saved by careful work, requiring five dollars' worth of time? I know something of the problem of saving teeth for those who cannot pay large fees, and I know some of these unfortunates are in better condition, because it was necessary for them to have large amalgam restorations, while their apparently more fortunate brothers were decorated with gold crowns and other alveolar appurtenances.

Discussion of Dr. Crandall's Paper.

Dr. L. A. Cimerman, Fort Plain, N. Y.

The profession at large owes Dr. Crandall a debt of gratitude for the work he has described in his paper. His experiments have verified the findings of Dr. Black. Dr. Black has been our authority on this question of amalgams for a number of years. Now that Dr. Crandall has taken up the problem, and, working it out from different angles, arrives at practically the same conclusions, we are nearing the scientific solution.

Papers of this character are as "bread thrown upon the water;" they will yield good to every thoughtful dentist. We will not all accept all of the ideas advanced in their entirety, yet we will be influenced in our work and ultimately may follow the methods advocated.

It is not an easy matter for one who has been working along certains lines for fifteen to twenty years to make radical changes. We grow into these new methods slowly.

Personally, I am one of J. Foster Flagg's disciples, and I doubt if any man was ever more conscientious in his work than Dr. Flagg. He taught us to make our own alloys, using zn. cn. and gold with the different formulas. In the early nineties his clinical experience was of value, especially when backed up by records.

But time is no respecter of persons or methods. We must accept the undisputed laws that govern our work.

The author speaks very plainly and emphatically on "adaptation and condensation"—very important points. However, there is a question in my mind as to his method of obtaining adaptation and condensation. Serrated pluggers have been advocated and I have tried them (without the mallet, however), but returned to the old ball burnisher. Amalgam is a treacherous material. If direct pressure is applied, the top will be condensed at the sacrifice of the other portions. And unless pluggers are used of the right size and shape for each individual cavity, I have grave doubts about good condensation and graver doubts about the adaptation.

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Presumably many here have removed old amalgam fillings of fifteen or twenty-five years of service and found that it was necessary to drill out *every* portion of that filling. Very small particles on the floor or walls of the cavity were removed with nearly as much difficulty as exyphosphate cement.

Also, have you ever noticed your mortar the next morning if your assistant had not cleaned it the night before, and found thin scales of amalgam adhering to its sides? And did you try to remove those scales by brushing them out with your finger? You will find those scales hard to remove when you consider the flat, smooth surface they are on. And further, water standing in the mortar several days will not loosen them, hence we must conclude that there was good adaptation. And how was it secured? *With a ball burnisher.*

Now, if we can burnish the amalgam to the walls of the cavity as accurately as to the mortar, we certainly will have watertight fillings. The burnishing must be from the centre to the walls of the cavity with sufficiently large burnishers, beginning with a small amount of amalgam and using smaller burnishers at intervals. Sufficient pressure must be used in the cavity as well as in the mortar.

Dr. Crandall uses some strong language when he speaks of the use of the matrix, and he is certainly justified, for an amalgam filling put in without pressure would be as serviceable as a gold filling put in without pressure. And, again, in using a "sloppy mix" it is *impossible* to use pressure, even though a matrix is in position.

I must agree with Dr. Crandall's arrangement of "chief causes of amalgam failures." Cavities carelessly prepared will never hold serviceable fillings. Careless or indifferent work of any character never pays. Five of the seven causes enumerated are under the direct control of the operator. There is not a man practicing dentistry but can, if he conscientiously tries, prepare good cavities—he can condense and adapt his amalgam fillings and can finish his fillings so that they are smooth and of proper contour.

So far as unbalanced alloys, or alloys that flow and fracture, are concerned, that is beyond our reach. The manufacturers are not to be criticised for what they give us. We have not asked them to experiment with each melt to determine the exact balance. It is up to the profession to require such alloys, and I sincerely hope that before our days of usefulness have passed, some reliable alloy will be marketed, that when we reach the great Beyond our immortal spirits will not be impeached for the black ditches we have left behind.

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"Common Sense in the Treatment of 'Riggs Disease.'"

By Howard T. Stewart, New York City.

A friend of mine asked me what was to be the title of my paper. I told him it was "Common Sense in the Treatment of 'Riggs Disease.'" He said, "What a foolish title!" I said, "Why do you say that?" He said, "There *is* no common sense in treating Riggs disease. Nobody but a d——n fool would treat it." And there is much to make us partially agree with this friend. However, if one is going to treat it, I know of nothing that will require a larger stock of good common sense.

Truly, we meet with the most profound discouragements, and I will take occasion here to say that the man who gives up a good general practice to embark entirely in the treatment of Riggs disease begins a most dangerous voyage, and unless he is peculiarly fitted for the work, and unless he is to a certain extent financially independent of his practice, he should best think several times before he does it, and then he should better be sure that he would rather treat Riggs disease for fifty cents than to do general practice for a dollar. For, no matter how successful he may be, the chances are that he would, with the same ability, have made more money in the general practice.

Moreover, you may rest assurred you are entering a very unpopular vocation. The fixed belief that this disease cannot be cured has so long held sway over the dental mind, and more particularly over the medical mind, that when you pose as a man curing this disease, a certain proportion of the profession will regard you with grave suspicion, and some with the utmost hostility; some will be inclined to regard you as a man who has failed to "make good" in general practice, and who has taken up the treatment of Riggs disease as a sort of advertisement, and no matter what you may show them, the majority of these will be of the same opinion still. Dr. Riggs himself suffered much from suspicion. I am speaking now of that proportion who actually believe these things, and who are determined to continued to believe them.

All this is not entirely without justification, for if there has been anything in dentistry that has been abused to the last degree, it is the treatment of Riggs disease. So many cases have been treated and only the most temporary results obtained; so many men have deceived both themselves and their patients in regard to this treatment that, to a large extent, the medical profession, the dental profession, and the people generally, have good reason to be exceedingly sceptical.

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There are, of course, a large proportion of the profession who will believe in you and who are perfectly honest in their expressions about it, and still a smaller proportion who believe in you and your work and who will refer a patient to you occasionally. This proportion is very small.

I do not mean to convey the idea that only a very small proportion of men in general practice are treating this disease in their private practice—not at all.

Far more men are treating it and getting good prophylactic results than ever before, and the proportion will continue to increase and it should increase. The number of general practitioners who do this work successfully must very greatly increase if the people are ever to get anything like the service along this line that they need.

There is enough Riggs disease in New York City alone to keep a thousand specialists busy every minute of their time, and this, mark you, in addition to all the work which the general practitioner is now doing.

In other words, if all the Riggs disease treatment was done just as it is now done, there would still be more than enough left (that never will be done) to keep a thousand specialists busy—and then some to spare.

I will put it in another form:

Two hundred thoroughly trained and efficient Riggs disease specialists, working seven hours per day strictly on Riggs disease treatment, could do more for curing Riggs disease and keeping it cured than is now done by all the specialists and all the general practitioners put together in New York City.

One thousand specialists could not do all that is necessary.

More than seventy-five per cent. of the adult population have some form of Riggs disease which needs treatment and constant after-care. Take this home with you and figure it out for yourself, and if you know Mr. Rockefeller well enough, tell him the real situation from a health standpoint and get him to endow an institution to further the treatment of Riggs disease generally. No other institution in its influence on health would be so far-reaching in its results. Absolutely no other health movement would so generally affect the human race, or be capable of so increasing the longevity and efficiency of civilized man.

This is a very strong statement, but it requires only a little thinking to see that it is true.

Characteristics of Riggs Disease.

In undertaking the treatment of this disease it is well for both dentist and patient to understand that a cure is often difficult to obtain and sometimes difficult to maintain; that it requires their perfect co-operation; that while it is often very slow in its

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progress, it is usually as certain as death; that it means not only the loss of the teeth, but the constant infection of the whole system from the bacterial poisons formed and absorbed into the system—some systems having, of course, more immunity to this infection than others. These bacterial poisons are absorbed, as Dr. Alonzo Nodine has so admirably pointed out and emphasized, through the pockets, the tonsils, mucous membrane of the mouth, the stomach and the intestines, and he shows how these produce the various systemic diseases.

It should be understood further that these conditions of the mouth are, to begin on, brought about by some wrong systemic condition, the majority of these being of a slow, insidious, chronic nature that give little warning and comes on almost like old age. They are, for this reason, more dangerous than the acute disease that cause the patient to seek immediate relief. There must be entire eradication of the disease from the gum, the peridental membrane and the alveolar bone. If any inflammation remains at any point, it is liable to slowly extend into the entire alveolar body.

Talbot has pointed out to us that this disease is inflammatory—that it is not infectious—that the infection comes after the inflammatory stage begins. It is the inflammation and not the pus that causes the absorption of alveolar bone.

This inflammatory stage often begins many years before the infection takes place, or before the patient notices anything wrong or even before the average dentist would, after close examination, pronounce it to be Riggs disease.

Effects of Climate on Riggs Disease.

Talbot says: "The disease is admittedly on the increase."

People living in cities and spending their lives in the house are more subject to it than people in the country or those living out of doors. Hunting dogs and dogs sleeping out of doors are much less subject to Riggs disease than pet dogs of the house. I have examined the mouths of many hundreds of hunting dogs in the South who stay out of doors practically all the time, night and day, and I have yet to find a case of Riggs disease among them, but the pampered pet house dog is very subject to this trouble. This alone shows clearly the effect which diet and living have in producing or preventing Riggs disease.

I have also examined the mouths of hundreds of negroes in the South, and I find that the plantation negro is far less susceptible to Riggs disease than the house negro in the cities.

Talbot also points out the effect of climate in producing Riggs dis-

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ease. A volunteer from Montana, twenty-three years old, lost nearly every tooth in nineteen months' time in the Philippines. This, of course, was due to the very radical change to an unaccustomed climate. He shows further than out of a hundred and twenty-seven soldiers, fresh from the Philippines, that only eighteen were free from Riggs disease; and, further, the very interesting fact that while the age of the men examined ranged from twenty-one to fifty-two, the largest number was among the men aged from twenty-one to thirty. He also points out that people living in the Northwest, where it is extremely cold, and where they live much in hot rooms, suffering from the extremes of cold and heat, are more subject to the disease than people living in a temperate climate.

I mention all these things to emphasize the fact that it is only common sense to take into consideration environment and systemic conditions, and to show how foolish it is to ignore them.

Talbot speaks of these conditions as setting up "an inflammation in the capillaries of the alveolar process," and says: "No matter how short a time the cause may exist, if the inflammation is once set up, owing to its peculiar action in the alveolar process (even though the cause be removed) interstitial gingivitis becomes chronic and the destruction of the tissue continues."

In speaking of the atrophic form of the disease, Kirk says: "Just what are the poisonous substances contained in the blood stream that, when carried to the alveolar tissues, set up the decalcification process (the halisteresis of the bony sockets of the teeth) is not known, nor do we know by what agency these toxic irritants effect their results."

To control this inflammation and to keep it controlled, in addition to the local treatment necessary, there are numberless systemic conditions that may be considered. One of the chief among these, probably, is the elimination by way of the intestinal canal. This, comprehensively considered, is so great a field that in a certain sense, directly or indirectly, it contributes almost to the entire realm of general medicine.

Constipation.

One thing about which we are much concerned is habitual constipation. Whatever may be the cause of constipation, whether it be from torpidity of the colon, from too much animal food, or the *wrong kind* of animal food; whether it be from the nervous tension of modern life; whether it be from lack of exercise or physical development; whatever may be the cause, a determined effort should be made to overcome it, and especially to keep the bowels well open and the system as free from auto-intoxication from the intestinal canal as possible, until we get a proper healing of the tissues. Most people imagine that if they have a move-

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ment each day they are never constipated. One may, through habit, at a certain time each day, have a movement and still be very much constipated, because the peristaltic action may be weak and may only partially evacuate the bowels. Besides this, once daily is not enough. The animal creation generally could not remain healthy and have one movement a day—why, then, should man? Having one or two movements a day is pure habit—a habit cultivated for generations. For perfect health, two movements a day are essential, and these should be free and full movements. No one thing will contribute more to general health and length of life, and no one thing will do more to prevent an attack of Riggs disease after we have cured the case.

Man, we are told, is born with the intestinal canal bacteria free, but it is soon invaded by micro-organisms. The adult passes in the fæces from thirty to fifty billion bacteria. Most of these are harmless under usual conditions, but when these conditions are changed they are capable of becoming pathogenic. If these are retained in the bowels instead of being evacuated, think of what dreadful conditions this continued retention from day to day and year to year may mean!

Some authorities go so far as to say that (excluding the infectious diseases) ninety per cent. of all sickness is due to auto-toxemia from the intestinal tract. If this is but half true, what a serious matter it is in producing all those various systemic conditions that accompany and cause Riggs disease.

To deal successfully with habitual constipation is often exceedingly difficult for the most skilled physician, and in these cases it is very often advisable to consult with a specialist or to turn the case over to him entirely. I know it is usually difficult for a dentist to consult with a physician, especially the regular family physician. The dentist is placed in a peculiar position. First of all, the physician (generally speaking) has no respct for the dentist's knowledge of medicine, nor for his opinion —and usually this lack of respect is well-founded.

The physician usually thinks that, as there seems to be nothing especially the matter with the patient, it is useless to consider a course of medicine or diet or habits simply because there is some inflammation of the gums or looseness of the teeth. Nearly everybody has it, so why make such a fuss about it? And he treats the dentist with good-humored consideration, but does little or nothing in the matter.

It is with the physician as with the dentist—he must understand the insidious chronic conditions *accompanying* Riggs disease, *causing* Riggs disease, and *being caused by Riggs disease*—the vicious cycle. Further, he must be in sympathy with the proceeding, or the co-operation is a failure, and usually results in humiliation to the dentist.

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The patient catches the physician's spirit and feels that it is something of foolishness—that the dentist is wading into water beyond his depth—that all he should think about is what he can do *in the mouth.*

Then, just as soon as the gums are healed and apparently well, the patient wants to pay his bill and get away, feeling that to do anything more either as to systemic treatment, diet or after-work on the gums and teeth is unnecessary—is a waste of time and a sort of graft on the part of the dentist.

It is then perfectly clear that even the thoroughly capable dentist cannot co-operate with all physicians.

Treatment Under Varying Conditions.

If you find nothing else the matter with the patient physically, if the local conditions yield readily to local treatment, then by all means give the local treatment and let that end it, with possibly a little good advice as to diet and mastication and proper living, and which you know before hand your patient will take good naturedly and absolutely disregard.

In such cases it is only common sense to treat locally and depend on prophylaxis.

Again, even if the patient is living a radically wrong life—if he is indulging in high-balls and "wasting his substance in riotous living," and you know it, and you know he is going to keep on at it, then it is only common sense to give him the best local prophylaxis you can at stated intervals, and you will often be astonished at the results obtained and kept; but it is not common sense to tell that patient he is *cured,* and let him go away with this idea simply because the flow of pus has stopped and the teeth have tightened and a beautiful pink and healthy condition of the gums follows. All this is no sign that he is cured (at least, as the patient understands a cure), and unless we tell him he is liable to a recurrence or to gradual dissolution of the tissues, even with good after-prophylactic care, this patient will some day think that we either were not honest or did not know our business.

I would not for one moment be understood to undervalue the magnificent work done by the prophylactic men working along these lines, the result of which are a delight to see; but neither would I have it thought that all saveable teeth can be saved by purely local treatment, because they cannot.

We may cure the mouth and for a long time keep it practically cured by constant cleanliness and stimulation locally, but we are, as it were, *covering up the symptoms that warn us of the systemic or organic disease, that may result in cutting off several years of the patient's life.*

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When we think of it in this light we can readily see what a solemn duty devolves upon us, as *we are in a position to do more than any other class of men to anticipate serious trouble and guide people into the hands of the medical specialists.*

Symptoms and Diagnosis.

The one chief idea I would urge is the study of the diagnostic signs of the mouth leading up, of course, to general symptoms as well. Accompanying Riggs disease are certain differing symptoms, certain different peculiar appearances that characterize the surrounding tissues in different systemic conditions, not always constant, it is true, but sufficiently so to lead us to investigate other symptoms. These symptoms and appearances are recognized only by long experience and observation, so that it comes almost as intuition. Only a short time ago your essayist had under his care a physician, aged thirty-eight. This man was robust and vigorous, enjoying good digestion, a fine appetite, and apparently in perfect health. There was a profuse flow of pus. Patient was discouraged as to the condition of the teeth because he had been treated twice with no advantage, and he said he believed there was no cure for Riggs disease. About these teeth we found a peculiar appearance of the gum that often precedes or accompanies kidney trouble. The patient laughed at the suggestion that there was some systemic trouble behind the mouth trouble. He said there was no healthier man in New York City, and, indeed, he looked it. Nothing more was said about the matter, but the local treatment was pursued vigorously until the pus had ceased to flow and the gums retracted in apparent cure. The patient was delighted with the result. I had been closely watching the gum tissues, as I find more can often be definitely ascertained after the gum heals from local treatment than before, while so much inflammation is present. There still remained a certain shape of the gum septum and a certain peculiar appearance that is impossible to describe which are symptomatic.

Physical examinations were then made, and after repeated tests he brought me the report of Bright's disease.

I am now watching the case with intense interest to see what the systemic result will be, since the discharge of pus into his mouth has ceased and since he has begun to diet rigidly. He would not diet at all before this.

This brings us directly to the fact that many times *serious systemic or organic troubles may be suspected and then diagnosed from early symptoms in the mouth, when they would not otherwise be suspected until a much later date.* Think what this means and what a field it opens up for the dentist! Think of what it means for tuberculosis patients and those with a tendency thereto!

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Some years ago I warned a little woman who is now in Colorado that she was in a rundown condition, and that she should change her mode of life and do something to build herself up; that if this was not done we could not hope for the best permanent results to her mouth, and that such conditions sometimes resulted in tuberculosis. She was at this time under the care of her physician, who suspected nothing except "anæmia"—that name that covers a multitude of sins. The advice was disregarded, and later an examination showed she had developed tuberculosis.*

And think of all the various chronic diseases slowly brought about in our "present-day civilization," the beginnings of which are quickly reflected in the mouth if only we are able to read the signs. No wonder that great man, Dr. Charles Mayo, said the next great field of preventive medicine should be opened up by the dentists.

But I do not think Dr. Mayo himself thought of the possibilities of diagnosis from the early symptoms in the mouth before the formation of pus occurs, or even before the patient has any inkling that he is physically out of gear.

I certainly did not intend to write at so great a length on these things, but I am so impressed with the importance to the human race of the inter-relation between systemic conditions and oral manifestations, and I am so impressed with the extreme value of mouth signs as early warnings of approaching systemic disorders, that I believe a stimulation of interest in this direction may lead to a close and systematic develop- and classification of mouth signs (now only in its infancy). These will be ultimately of more value than all the elaboration possible of methods and procedures to stop the flow of pus, to eradicate inflammation and to tighten the teeth.

I predict that before very long, not only the specialist in Riggs disease, but the general practitioner in dentistry, will devote himself so assiduously to observing early signs in the mouth of systemic changes, that then indeed will dentistry have opened up, not only the next great field of preventive medicine, but will have opened up and *occupied* the *greatest* field of preventive medicine.

Medicines Used in Treatment of Riggs Disease.

The question is often asked, what medicines are best to give for treating Riggs disease systemically? Of course, the question is always asked without really *thinking*, for it is almost like asking a physician what medicines he uses in treating general chronic sickness. "Then," some one says, "your idea is that a man shall practice general medicine?" Not at all. The nose and throat man does not practice

*I invite personal correspondence from all who have made a study of these signs.—H. T. STEWART.

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general medicine, but certainly he is supposed to have some considerable ability to diagnose general diseases and to refer cases to the proper medical specialist, as well as to administer medicines for certain conditions and to regulate diet and habits of living.

Some of these things are essentially within the domain of the dentist treating Riggs disease and not the physician. However, he must be prepared for this, as there is grave danger of administering medicines for symptoms, behind which may be serious trouble of which he may be ignorant, a trouble that would be found by the physician after thorough examination.

The only rule to follow is to be sure there is nothing the medical specialist should handle before we essay to handle it alone.

Talbot says: "The examination of the urine is the only means at hand of ascertaining the general condition of the system underlying interstitial gingivitis." Those interested in such examinations will do well to refer to Dr. Talbot's late work, which he calls *"Interstitial Gingivitis and Pyorrhoea Alveolaris."*

In speaking of acid auto-intoxication he says: "If the kidneys do not carry off the surplus acidity, a greater strain is put upon the lungs, skin *and mucous membranes* of the mouth. The alveolar process and gums, being doubly transitory as well as end organs, contain excretive as well as secretive glands.

"The gums are the first structure of the body which indicate systemic defects."

I put the last statement in italics to again call attention to the opportunities of the dentist to make early diagnoses of troubles that would entirely escape the physician—in fact, which the physician would have no opportunity to investigate—and some day, generally speaking, a physical examination will include an investigation of the condition of the gums and mucous membrane of the mouth, as well as the lungs or the kidneys—*and the examination will begin in the mouth.*

Riggs Disease as a Cause of Systemic Disease.

It will be noted that somewhat more stress has been laid on the effect of systemic conditions as causing Riggs disease than on Riggs disease as causing systemic conditions. Lately our dental literature has teemed with the most graphic pictures of systemic infection from Riggs disease. Everything from stomachache to heart disease has been attributed to it, and in such a way as would give the uninitiated casual reader the idea that we had suddenly found the cause of all systemic infection, the origin of which was heretofore unknown. A physician of wide reading and scientific acquirements said to me, "You dentists are running mad on this question of pyorrhea."

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He spoke of how the sinuses discharge sometimes spoonsful of pus each day into the stomach with no appreciable systemic effect. He says, "The medical profession have begun to laugh at your literature."

Now, however much excuse there may or may not be for this view, certain it is that we are, in our enthusiasm, in grave danger of attributing to Riggs disease, results out of all proportion to the actual existing facts. True it is that Riggs disease can, and does, produce the most serious systemic disturbances—heart disease, rheumatism, kidney lesions, stomach and intestinal and nervous troubles, anæmia, ulcers, etc., etc. At the same time it may not be the wholesale cause of such a great proportion of these as we might be led to believe from some of our overenthusiastic writers; and we might do well to call a halt for further and more careful examination before we render ourselves ridiculous. "A little learning is a dangerous thing" is quite *apropos* just here.

Of course, when we see a profuse flow of pus from a well-developed case, we all wonder how the patient lives at all. With pus exuding constantly from about all the teeth, millions of bacteria of the most virulent type being swallowed every day, and this not for a month or a year, but sometimes many years, to figure how the system can offer the resistance it does to this condition is really beyond our ken. But if there was not a wonderful immunity enjoyed, and if each case presented the immediate dangers pictured in some of our literature, a larger proportion of the adult human race would be threatened with decimation.

The ravages of this disease are direful enough, but we must not lose sight of the fact that usually the same conditions that cause the systemic derangement *also* cause Riggs disease. It is to be remembered oftentimes, too, that while we can trace no infection of any particular part of the body, there exists a general rundown condition accompanying Riggs disease that clears up like magic when the mouth is freed from pus by local treatment.

It is true, too, that when Rozenow shows us the various changes that the streptococcus is capable of undergoing, and the many diseases it is capable of causing, we stand aghast at the possible consequences of systemic infection from oral sepsis.

Rozenow not only tells us that these diseases are possible from the streptococcus, but he actually produces these various diseases with this germ.

Local Treatment of Riggs Disease.

Now, coming to the local treatment of Riggs disease, we have not time to take up all the procedures for prophylaxis and the various medicaments that are useful as local applications; and there *are* many, in spite of the contention of some that normal salt solu-

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tion is all we should use. This is going to the other extreme, and certainly is not in accord with common sense.

The local operation your essayist has been using for many years (where the conditions seem to indicate it) I will describe briefly, giving you the main points. It will be clearly understood that this is not attempted in all cases and must be used with judgment.

Of course, it goes without saying that the field should be clean, or fairly so. A slight smear of phenol is made at the point the needle is to enter—this slightly anesthetizes the gum. The needle enters practically without pain; then the needle follows up the area of infiltration as usual. Novocain with adrenalin is the anesthetic used.

I like to get a rather deep anesthesia so there will be no pain in the operation.

A very small lancet that cuts on the end and sides is then carried to the bottom of the pocket, and then a little beyond the bottom of the pocket, sometimes going at this point to the edge of the alveolar bone. We then follow the pocket all around its margin, separating the tissue slightly from the tooth. If the pocket is very deep on the labial or lingual surface, it is sometimes advisable to slit the gum from the bottom of the pocket to the margin of the gum, making two flaps, which give way before the "scaler" and allow us to work freely. This usually causes no pain at all. The word "scaler" is put in quotations because we now want something more than scaling. Some years ago I presented to the profession the idea of scraping (or "planing") the cementum, removing the external surface. Very little notice seemed to be taken of this idea at the time, but since then a large part of the profession have come to regard this procedure as absolutely essential to a cure. Such instruments as the Carr, the Hoff and the Hartzell are designed for this especial purpose.

Men get good results when, as they say, they dig away long and very patiently and finally "remove every vestige of calculus," when maybe there was never any calculus to begin on. They get results because they are gradually removing the infected surface of the cementum itself while groping and scraping around after imaginary calculus.

What they have really been doing is scraping away something of the infected surface of the cementum, and they ascribe the results that follow to the supposed removal of calculus. It is perfectly true that in some cases they have actually removed calculus, and it is just as true that in many cases where they get the same result there was no calculus.

After making a slight incision at the bottom of the pocket (and there is usually no pain whatever connected with this), we then proceed to scrape the surface of the cementum down to the bottom of our

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incision. The infected surface of the root is scraped precisely as we would scrape it if we had it out of the mouth and held a blade upon it at right angles; just as we would scrape a hickory stick with a piece of glass or sharp knife, getting off a very little bit of the entire surface.

I mean, of course, the surface of that part only that has been exposed by the pocket and the incision. In speaking of this, many listeners have in some way gone away with the impression that we advocated scraping the surface of the entire root. A moment's reflection will show us that we would have dug the root from its socket before this could be done.

In this operation we pay no more attention to the deposits of calculus than if they were not there, except, of course, to remove them so that we can then remove some of the cementum beneath. In other words, the calculus is not considered except as débris that we want to get rid of in order to begin our operation.

It is about as reasonable to expect proper healing and a permanent cure from simply removing deposits from a pocket as it would be for a surgeon, in an operation for carious bone, to simply remove the débris from within the wound itself and then expect a cure to follow from prophylaxis and stimulating applications.

After we have removed, as nearly as we can, a slight bit of the surface of the cementum, thus removing the very tenacious bacterial placques adhering thereto, we then carry a twenty-five per cent. solution of sulphuric acid in glycerine on loose cotton beneath the gum in contact with the scraped surface of the cementum. This acid, of course, first slightly decalcifies the root surface; second, it loosens up any particles of mucous placques still adherent; and, on account of its violent affinity for water, it is supposed to enter and combine to a certain extent with the contents of the exposed lacunæ. These lacunæ and cannaliculi were said by Clement, of Mississippi, to be partially obliterated in the external layer of the cementum of Riggs disease teeth. This cementum, he states, is hypercalcified and dense.

Use of Acids in Creating Riggs Disease.

Many years ago Dr. James Truman, after repeated and elaborate experiments with all kinds of medicines, came to the conclusion that the only ones that gave any real results (the action of the medicines only being considered without reference to surgical work), were the acids, and claims benefit from these only. He advanced no theory as to their mode of action. He recommended aromatic sulphuric acid applied in the pockets.

I am perfectly aware that where acids were advocated many years ago, that lately the tendency has been to get away from them, but this

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is unquestionably a step backward and a serious mistake. The trouble was that too much was expected of the acid—that it was expected to take the place of the surgical work, and this no drug can ever do.

This acid is often beneficial, as I am in the habit of using it within the pocket during an operation, when it helps in removing the surface of the cementum on precisely the same principle that Dr. Callahan enlarges a root canal. At the same time it is sterilizing the cementum surface as nothing else will. Where we cut away the crown of a tooth, and where the root is in a desperate condition, it sometimes is helpful to gently force a weak solution of this acid through the apex by means of a soft rubber cone on the same principle utilized in pressure anesthesia.

In talking of the acid, I have gotten away from the operation. I neglected to say that the bottom of the pocket is usually pretty thoroughly curetted. The tendency lately has also been to get away from this, which is another mistake. I should much rather overcurette than to undercurette. The idea being advocated by many that we should go so carefully beneath the margin of the gum, and "gently and deftly" remove all the tartar without inflaming the gum, or wounding the cementum, allowing the gum to quickly and closely hug about the neck of the tooth after the operation, and without causing any soreness or discomfort, and in a day or two presenting the margin free from inflammation and beautiful to look upon (and it certainly does do this), is very attractive, but has been productive of much harm, so far as the really effective treatment of the disease is concerned. We have actually had men advocating the use of blunt instruments to push away the tartar without cutting the cementum. We have had men using an acid with the idea of attacking the tartar and of not affecting the cementum. Where is our common sense? Why should we want to keep the acid applied under the gum from attacking the surface of the infected cementum? If we are uneasy about the harmful effect of a slight amount of acid applied to the surface of a root, take an extracted root, paint a solution of the acid over the root surface; lay it away for an hour, then examine it and see if you think it would have been ruined if the same effects had occurred in the mouth! Then think of how much less effect it would have in a wet pocket and you can draw your own conclusion.

I will say that I have been using the acid constantly for many years, and have never seen the slightest ill result on the cementum. When I first advocated the scraping of the cementum I was using full-strength sulphuric acid, holding the pockets open after I had operated with an instrument and working the acid well down to the bottom of the pocket with an instrument. Of course, this was barbarous and totally unnecessary, and healing was very long in taking place; but the fact

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that most excellent permanent results finally followed this procedure, and that no ill effects whatever resulted to the cementum, shows that it is perfectly safe so far as the root of the tooth is concerned to use almost any strength of acid in the pocket.

Furthermore, during all my professional life I have been using one-half of a one per cent. solution of sulphuric acid for cleansing the entire surfaces of the teeth, and I have never seen the slightest ill results from this procedure.

Just here it seems only fitting to say that whenever occasion arises we should esteem it a privilege to pay a tribute to the common sense but remarkable work done by Prof. Wm. J. Gies in his revolutionary investigation of acids in the mouth.

Furthermore, I have never used any alkaline solution to counteract the effect of the acid, either when used in a mild solution to cleanse the teeth or when used in a strong solution in the pockets.

In regard to curetting the pocket thoroughly and the application of a strong acid, causing inflammation and preventing the tissues from healing and causing scar tissue (these objections being so often urged), I will say that my observation teaches that this degenerate tissue should be curetted as a surgeon would curette degenerate tissue lining a womb, in order that new and healthy tissue may be formed, and that, as this chronic low form of inflammation has been so long present that an acute inflammation is not only not deleterious, but is exceedingly beneficial, and that tissue so operated upon will, after healing, much better resist the reincroachment of the inflammatory condition producing Riggs disease than tissues operated upon by the so-called gentle and deft method of removing the tartar.

To sum the whole matter up, we want a common sense and sane procedure in dealing with the systemic condition, and we want a clean-cut and really effective surgical operation in dealing with the local conditions. I take it that it is not necessary to say that in advocating this surgical procedure I refer only to the cases developed where surgery is necessary. Where we have simply a tumefaction of the gum tissue and a gingivitis caused by deposits just underneath the margin of the gum, and by the accumulation of filth and gelatinous placques, and where there is no real gum lesion, it is necessary only to cleanse the parts and to keep them clean. We can be as gentle and as deft about these cases as we please, and it is not necessary to be otherwise.

Conclusions.

In conclusion I will refer briefly to the following:

1. I believe in "prophylaxis" (in its common acceptation) to the fullest extent.

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2. I believe the signs of the mouth will be much more closely studied and are destined to play a very important part in medical diagnosis some time in the future. However, the study of these signs is now only in its infancy and suggests a field capable of great development when studied together by dentist and physician.

3. Vaccine treatment, in the essayist's opinion, has proved of no practical value in the treatment of Riggs disease.*

4. Acids applied locally are valuable. They loosen mucous placques, decalcify and sterilize the surface of the cementum, stimulate a renewed vital connection between the cementum and the organism at large.

5. Just here it seems only fitting to say that whenever occasion arises we should esteem it a privilege to pay a tribute to the common sense but remarkable work done by Prof. William J. Gies in his revolutionary investigation of the effect of acids in the mouth.

6. "Scaling" teeth of tartar deposits does not and will not cure Riggs disease.

7. It is understood, of course, that the physician must as naturally refer patients to the dentist for the cure of some systemic conditions caused by oral infection as for the dentist to refer patients to the physician for systemic troubles that are reflected in the mouth or that he may otherwise suspect.

8. Where bridgework is to be applied to teeth after treatment for Riggs disease, it is only common sense that it should be constructed so as to be strictly hygienic and usually should be removable. It is also only common sense not to use one of these teeth as abutments. It does not promise to be permanent and does promise to act as a source of inflammation. It is only common sense that all lateral strain so far as possible should be avoided.

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*I have come to this conclusion not only from my own observation of numerous cases but from the conclusions reached by men like Dr. Arthur H. Merritt; men who have the technical ability to manage Riggs disease without the use of vaccines. I do *not* draw my conclusions from the reports of men who use vaccines, and who depend on others to do the surgical work, ascribing to the vaccines the results that follow, and speaking of the surgical work merely as an adjunct. Neither do I draw my conclusions from reports made by men who do the surgical work, and who have taken up this treatment for a year or two and who report results in their enthusiasm, being prejudiced in their favor.

I refer especially to Merritt's experiments, as I know of no other man who has given *so fair a test* to vaccines, at the same time being most anxious that they prove successful, trying in numerous instances to see if he could be mistaken, even after being convinced of their uselessness; and yet after all, after seven years experience, being forced most reluctantly to say that he sees no practical benefit that has in any case ensued. In other words, being successful in his operative procedures and systemic considerations, he can see no possible way in which the vaccines have helped him to cure a single case.

This accords perfectly with my own observations, and this being the case, it becomes a duty to warn inexperienced men who would "rush in," and do harm—as certainly they must, if they do no good—we know little as yet as to the ultimate general effects of such treatment.

Such evidence as Merritt's should bear especial weight, as he tried hard to make the treatment a success but, *against his will, was finally convinced of the delusion.*

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Lecture to the Bureau of Social Service, Morristown, N. J.

By Joseph Kussy, Ph.G., D.D.S.
Oral Surgeon, Newark Beth Israel Hospital; Chief Oral Surgeon, Newark Free Dental Clinic Association.

For many years the medical profession devoted all its energies to the curing of disease. As the different maladies were encountered, various treatments and remedies were proposed and tried. Not always was there perfect unanimity as to the particular cure for a certain disease; many were tried and found wanting. But the day of enlightment always came, until now only very few of the ills that man is heir to fail to respond to intelligent medical practice.

With the conquering of the dread disease came a new thought. Why should the human body be thus ravaged? Cannot epidemics be checked? Cannot disease to a large extent be prevented?

Then came vaccination. Frowned upon by many, ridiculed and rejected by many others, it has become firmly established as a preventive of smallpox. That dread disease no longer runs its riotous course unchecked. Many a life has been spared by its timely adoption.

Much of the horror of diphtheria has been eradicated by the use of anti-toxin. The typhoid epidemics of the army are things of the past. In short, the grand old profession of medicine has been awakened to the desire to prevent disease where possible, instead of permitting it to exist and then trying to cure it.

In a recent article written by Dr. Chas. Mayo, that great surgeon made the statement that the future of the science and practice of medicine lay in the preventive field, and that the main field in preventive medicine is the mouth. In other words, that mouth hygiene is the coming study for the prevention of disease.

The Mouth as a Source of Infection.

When you consider that the mouth is the gateway of nearly all infectious diseases, and that it is the most fertile soil, the best culture medium for the development of pathogenic bacteria in the entire anatomy, you will readily realize how all important the maintenance of oral hygiene is, even in a healthy body.

Tuberculosis, pneumonia, influenza, la grippe, diphtheria, measles, mumps, all have as their main means of infection the discharges of the mouth.

In the report of the medical commission for the investigation of acute respiratory diseases, New York Department of Health, Dr. Wadsworth says: "From an hygienic standpoint, the secretions from the

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mouth constitute the chief, if not the only source of respiratory infection."

Severe cases of persistent throat inflammation and tonsilitis are caused by the infection from decayed or diseased teeth.

Out of 684 sarcomas in different parts of the body, 309 of these were found either to be on the lower lip, upper lip, tongue, or mucous membrane of either the soft or hard palate. One very frequent cause of these tumors is the constant irritation of a sharp edge of a decayed tooth. The teeth in the human anatomy are divided into two classes:

1. Temporary, deciduous or baby teeth.
2. Permanent teeth.

The temporary teeth are twenty in number; the permanent teeth number thirty-two. The first permanent tooth to erupt is the first molar at about the sixth year. Now, what happens when the temporary teeth are neglected? In the first place, decay in these teeth is more extensive and more rapid than in the permanent; the decay approximates the pulp more quickly; the child suffers unnecessarily; and frequently aveolar abscesses result and, alas! too often, the baby teeth are lost when they still had an important function to fulfill for several years. Their function primarily is to assist in the development of the jaws. When one or more are prematurely lost, the first permanent molar erupts anteriorly to its normal position; there is then insufficient room for the permanent teeth, and we find malocclusion, contracted arches, and then what?—mouth breathing. Caries of the teeth, or decay, as it is commonly called, is caused by the action of bacteria. These bacteria, formed by food particles lodging between and around the teeth, produce lactic acid, the acid that attacks tooth structure.

A perfectly clean tooth never decays.

Prevalence of Caries.

The prevalence of dental decay is astounding and alarming. A recent compilation of statistics in New York City shows that about ninety-seven per cent. of the children in the public schools have defective teeth. You will readily understand that a large per cent. of these children are not in a position financially to receive dental care. When you learn, as has been shown, that it takes children with unhygienic, decayed teeth at least six months longer than it does children with clean, healthy mouths to make the eight grades, you will realize the importance of mouth hygiene as an economic problem.

The child with decaying, aching teeth cannot digest its food properly. It suffers from malnutrition; there is no concentration of thought on studies, and the failure to advance with the normal child is self-evident. Earache is a most frequent accompaniment of decayed teeth, and neuralgias of the head are in nearly all instances due to some dental defect.

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In Cleveland, Ohio, at the Marion School, there have recently been conducted a series of experiments, remarkable in the results shown. Thirty children from various classes, backward in their studies, were selected as the principals in these experiments. It was found that in every case their mouths and teeth were in an unsanitary, neglected condition. They were put through a rigid course of mouth hygiene and their teeth were treated and filled, with the remarkable result that there was an increased average efficiency of fifty-seven per cent.

At St. Mary's Orphan Asylum, Worcester, Mass., the number of infectious diseases for many years caused great alarm: the average annual number being about 103 cases. It was found that by proper mouth hygiene, practiced among the inmates, this was reduced to an annual average of two, at which figure it has remained for several years.

Dr. Hunter, a leading specialist of London, has recently stated that fifty per cent. of the diseases of the alimentary tract were due to unsanitary mouth conditions.

Nature never intended that the mouth should be the harbor of disease, and yet it has become so by the degeneration of tooth structure, due to centuries of improper living, insufficient mastication and lack of oral cleanliness.

Dental Clinics.

Now, as to dental clinics. I believe that I have shown you, and the medical authorities are in perfect accord with us, that the health of the individual is largely dependent on the condition of the mouth. It follows, also, that the health of the community is dependent on the health of the individual.

Aside from this, we know that epidemics spread by infection transmitted from one individual to another. From the report of the Health Commissioner of New York City we learn that the main means of such infection are the discharges of the mouth. Do you not then recognize the necessity, the urgency, of doing something to improve existing conditions? You and those dear to you are continually exposed to infection, in the stores, in public conveyances, anywhere and everywhere. A cough or a sneeze from some afflicted one might possibly be the means of infecting some one dear to you.

The dental profession has for many years felt that a great injustice was being done the public in general, and the school children in particular, by the failure of the profession to properly instruct the children in the public schools in the principles of mouth hygiene. With this in view, we appeared before the Board of Education, in the City of Newark, to ask permission to deliver lectures on this subject in the public schools. The board accepted the proposition unanimously; a corps of lecturers

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was appointed. In the high schools, the pupils themselves were addressed on the subject of mouth hygiene and cleanliness. They were shown that, although the government had enforced the pure food law, which insists on the purity of all prepared food stuffs, that without mouth cleanliness the effects of the law were nullified, for this reason: The moment that this ideally pure food passes the lips into an unclean mouth, or one with decayed teeth, it makes a mockery of the law itself by associating with and being mixed with the most obnoxious, mischievous and ofttimes dangerous germs in bacterial life, and in this form it enters the stomach for assimilation. Of what use is our Pure Food Law Legislation? Where are its advantages if this all-important matter or oral hygiene is neglected?

In the elementary schools we went further. The nurses who have replaced the medical inspectors in Newark were themselves lectured to on the methods of instructing the children. The mouths of the little ones are thoroughly examined for dental decay and neglect, and if such exists, as it does in nearly all cases to a greater or less extent, the parents are requested to send their children to the dentist, and if the parents are not in a position to do this, the children are requested to visit one of the free dental clinics, and are granted leave of absence from school for this purpose for as much time as may be required.

We have two such clinics in Newark, and two operators and a nurse in each clinic, open every day from 9 A. M. to 5 P. M., except Sundays.

Municipal Maintenance of Clinics.

The first clinic was started a number of years ago with a number of volunteer operators, and was maintained by private subscriptions. The work grew to such proportions that the volunteers could not keep up with it. In the meauwhile the municipal authorities became aware of our existence, and it was deemed wise to ask for an appropriation. We were granted one thousand dollars. With this we hired two half-day operators to be in continual attendance. Meanwhile the work kept growing in volume; the demands of our resources kept increasing. The newspapers were kept informed of our activities, and some of our board members, laymen, prominent in civic affairs, had a bill drafted, permitting cities of the first class to appropriate $5,000 annually for the maintenance of free dental clinics. This bill was passed by the Legislature without opposition, because they had heard of the wonderful work we were doing for the poor, and we received the additional sum. We then opened another clinic.

Last year we grew very bold. Ours was a just cause. Of that we felt sure. We needed operators; some full-day operators. We had the unwavering support of the newspapers now; the clinics were under

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close supervision; the city authorities knew of our activities, and the results obtained. In this connection it might be well to mention that it has been estimated that of the dental defects among the school children, forty per cent. are sufficiently severe to necessitate frequent absence from school. We now had a bill drafted by the city attorney, with the support of the city counsel, asking for an appropriation of $10,000 annually, and this last year we received that amount. We are now contemplating opening another clinic. Permit me now to show you the results of our endeavors.

Results of Dental Clinics.

During the year ending December 31, 1913, the number of patients receiving dental treatment at the Market Street Clinic, which is in a remote section of the city, was 1,549, and the number of operations (treatments, fillings, extractions, etc.) was 9,913.

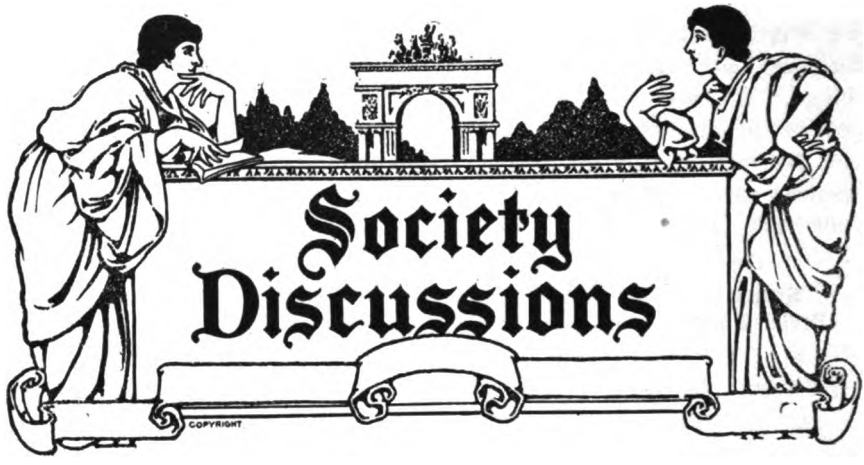
In the Newton Street Clinic the number of individuals was 3,921, and the number of operations 16,210, making the total number of patients 5,470, and the total number of operations 26,123 in only two clinics, and only children under sixteen years being accepted. These children are now referred to us from the parochial schools, as well as from the public schools.

The total cost of this work, exclusive of salaries, and our rent being free, was 1,596. The total value of the services rendered to the little ones, figured on the basis of very moderate fees, amounts to $22,097.

Ladies, the opportunity is yours for doing a great work, a work which indirectly makes for higher citizenship and healthier motherhood.

The boys and girls of to-day, the men and women of to-morrow, will be better physically, morally and mentally, if this work is universally carried out. Yours is the opportunity to be pioneers in this movement here in Morristown. This is real, personal, social service. Every individual effort that you make in this direction will carry weight and gain momentum as the movement grows. It is such efforts as this that help to elevate and encourage the less fortunate ones, spurring them on to noble deeds and loftier aspirations.

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Second District Dental Society of the State of New York.

March Meeting.

A regular meeting of the Second District Dental Society of the State of New York was held at the Kings County Medical Library Building, 1313 Bedford Avenue, Brooklyn, New York, on Monday evening, March 9, 1914.

The President, Dr. Lewis, occupied the chair and called the meeting to order.

The minutes of the last meeting were read by the Secretary and duly approved.

The paper of the evening was then read by Dr. Harold Stewart, and was entitled, *"Common Sense in the Treatment of Riggs Disease."*

Discussion on Dr. Stewart's Paper.

Dr. Paul R. Stillman, New York.

By way of prelude, I wish to state that I was unable to obtain from Dr. Stewart the text of his interesting essay, and have heard it to-night for the first time. I *did* obtain from Dr. Stewart, however, a list of sixteen headings or notes on which he intended to construct his work, and it is from the following four of the notations which he gave me that I have based my discussion.

Note 1. "We must go more into medicine than formerly."

Note 2. "Dental literature is rife with systemic infections. We must also consider the immunity from these infections."

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Note 6. "Dentists embarrassed in work with physicians because physicians do not think much of the oral effects on the system."

Note 10. "Local treatment deep and thorough—"cementum planed" or scraped—pockets and bone curetted followed with lactic acid or sulphuric."

Our essayist says, "We must go more into medicine than formerly," and by that he means that we should become more familiar with the work and thought of medical men. It is, of course, essential that the dentist should be a man of high academic training if he hopes to be rated as their equal, where the standard is one of brains and equipment. There is much complaint on the part of dentists of the seeming lack of interest physicians have for our achievements. It is true that the successful treatment of pyorrhea has been demonstrated by comparatively few practitioners of dentistry. The large majority of our best dentists fail to give to oral prophylaxis the attention which it deserves. The presence of gingivitis should become a warning to every dentist who believes in his heart he is doing his utmost duty by his patient.

Riggs disease is an inexcusable disease, for all the sequelæ dependent on the first gum inflammation may be traced directly to someone's neglect, and the profession is either directly or indirectly responsible. Whenever a dentist fails to treat a simple gingivitis or fails to explain its serious import to the patient, whenever he neglects to give proper instruction in the essentials of a mouth toilet, he falls short of his duty.

A septic mouth is often a most potent cause of many obscure and baffling systemic diseases. Let the profession of dentistry show the profession of medicine that it appreciates its opportunity by doing its full duty for the hygiene of every patient's mouth; that it recognizes and treats other diseases besides caries, and is able to cure them; for then, and not until then, will dentistry be recognized by medicine as a brother in the healing art.

There is a fixed belief among medical men that dentistry is a profession of slow scientific growth, and that dentists do not measure up, as the saying is, to the standard medicine has set for itself. In a broad sense, this is true, but in a sporadic sense, dentistry measures up with medicine in both science and research. It is to the individual dentist that the appeal must be made. I do not wish it to be understood that I think it is the duty of the dentist to leave his operating chair and go to the research laboratory. The point that I wish to make is that it is the duty of every dentist to treat and cure every inflammation of the gums in every mouth he sees, no matter how apparently trivial it may appear. Pyorrhea is always preceded by gingivitis, and unless it is treated in the early stages, the certain future destruction of the peridental membrane is

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inevitable. If dentistry would only rise to its duty as a whole, we could lessen the prevalence of pyorrhea by fifty per cent. in five years.

Use of Medicaments.

Concerning the use of the so-called antiseptic solutions, germicides and astringents as advocated by the essayist, I believe they are contra-indicated in the *surgical* treatment of pyorrhea. We must not lose sight of the fact that we are dealing with inflammatory processes that have been produced by bacterial invasion. Our surgery of the alveolus must be conducted with the accepted methods of modern surgery always uppermost in our minds.

When tissues, such as those that surround the teeth, have been infected for a prolonged period, they acquire to an unusual degree combative means of defense. The very presence of phagocytes in quantities assures us that nature is sending her army of defense to resist the invasion of these bacterial hordes. Each and every member of these millions of defensive leukocytes dies in battle, perhaps of indigestion, for he actually digests his enemy. The defensive power of the human body is beyond comprehension when we consider the attack upon it by its microscopic enemies. This normal defense must be conserved, and any application of astringents or escharotic germicides in solution or otherwise is an attack upon the normal defense. In other words, we are placing in the path of our surgical allies our best friends—the defending leukocytes, an additional enemy for them to resist. Our duty as surgeons is to invade this citadel with our instruments and literally tear down the fort to rake out the enemy into the light and air—not alone the bacteria themselves, but the very soil they live upon, house, home and chattels, for they are anærobic bodies and cannot live and multiply in the presence of oxygen. It is the necrosed alveolar process and peridental membrane lying deep down below the atmosphere of the oral cavity which affords protection to the infecting bacteria, and the inaccessibility of this peculiar structure about the roots of teeth makes possible the defense of these invaders. Their strategic position in the past has seemed well nigh invulnerable to surgeons, and were it not such a strong fortification the treatment of pyorrhea would be as easy as the treatment of feruncle, or common boil, for the infection is practically the same in both diseases. The only difference between them is this: The feruncle builds his house upon the sands, as it were, and the winds and storms of defense caused by the antibodies drives out the invading microorganisms within a certain definite time, viz., the leukocytes always beat the boils; but the same bacteria in the more impregnable position of the alveolar lesion make the fight in pyorrhea quite a different proposition.

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Riggs Disease Versus Pyorrhea.

The essayist seems to prefer the name Riggs disease in speaking of pyorrhea. Personally, I think there is as much reason for his preference as there is in calling the disease by any of its other numerous names, especially pyorrhea alveolaris. There are many precedents in medical nomenclature for honoring the names of those who have done great things along special lines, and the name of Riggs, before all others, is identified with this disease. But those who have written most on this subject seem to have settled down to the name pyorrhea, not because the name is a satisfactory one in its fullest descriptive sense, but for the fact that it has become the most widely used and most commonly accepted. Pyorrhea is but one of hundreds of things called "out of their name," as children say. The cavie has been persistently called a Guinea pig by the scientific men who use it most, yet its habitat is South America, and as it is a rodent, no stretch of the imagination could classify it with its porcine god-father. The nomenclature is loose and unsatisfactory because it compels those who discuss pyorrhea to use words which do not express their meaning. Rhein complained of this twenty years ago, and at that time gave to the profession a comprehensive classification which was based upon the pathologic symptoms which at that time were believed to be the important constitutional factors in its etiology. This classification was made by prefixing to the noun the lesion adjective, as diabetic pyorrhea, tubercular pyorrhea, etc. This was a most satisfactroy advance in the nomenclature of that period, and had subsequent investigations proved Rhein's contention, viz., that certain systemic functional diseases of the heart, kidneys, etc., are the originating causes of pyorrhea, perhaps this classification would be in general use to-day. But the theory that from an oral examination dentists could ever learn to differentiate a pyorrhea due to a kidney lesion (as in diabetic pyorrhea), or an endocarditis, or a tubercular infection, or a gouty diathasis, seems futile. Yet we have come to know that endocarditis has its infection from streptococcus of pyorrhea pus, from a convincing report recently made of a case by Hartzell. We know from Grieves's report of a case of arthritis ankylosis, where the patient recovered complete use of the limbs by the suppression of pus generating in an alveolar abscess. The list of infections which have been attributed to oral sepsis includes no less than fifty widely distributed diseases.

The classification and nomenclature that Fletcher gave us some years ago is, to my mind, most comprehensive and flexible. Feltcher ignores the venerable Riggs, puts pyorrhea in the archives, and asks us to use the name alveolitis. Definition: "An inflammation of the alveolus," alveolus meaning in the region of the alveolar process; and to describe

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the separate phases he observed he suggests these four prefixes: (1) Initial or simple; (2) Non-suppurative; (3) Chronic non-suppurative; (4) Chronic suppurative; the latter, chronic suppurative alveolitis, being synonymous with pyorrhea alveolaris.

Alveolitis is a name that all combatants in the constitutional vs. non-constitutional fight could unite upon, while in the Rhein classification a pre-existing constitutional cause is inferred. I do not *censure* our essayist for preferring the name Riggs disease to that of pyorrhea.

Alveolitis.

In suppurative alveolitis, the destruction of the gingiva and peridental membrane is invariably accompanied by a breaking down of the adjacent tissue. I believe that whenever the pus symptoms are present, a disintegration of bone has already taken place, and that pus never appears in Riggs disease until the alveolar process has been attacked. This is the theory of Fletcher, who says that no amount of gum treatment will cure the disease, and he states that this is evidenced by the fact that the gum tissues remain intact and nearly to their normal height long after deep pockets have been formed in the bone.

At the present time the etiology as described by Hartzell seems to be the most reasonable and convincing. My own clinical experience bears him out so far as I am able to deduce. You are all familiar with Hartzeli's etiology, so I will not review it.

Streptococcus Pyogenes Aureus.

We dentists are just beginning to realize that we are concerned with one of the most troublesome bacilli that medical diagnosticians have to deal with. I refer to streptococcus pyogenes aureus. The appearance of this bacillus in suppurative alveolitis is constant, that is, it is always present in microscopical examinations of the pus. I quote Leary, of Boston, who has made many hundred tabulated readings. The streptococcus is insidious in its attacks upon the functional activities. It will generate in a pyorrhea pocket seemingly in a most innocent and benign manner, disclosing itself to the trained eye of the dentist only after careful examination by such men as are familiar with it, and who carefully search it out. To the "common or garden variety of dentist" it is non-existent. From the medical men it is able to hide so successfully, so far as its oral manifestations are concerned, as to reassure him that its origin is to be looked for in some other region than the mouth.

The human economy is capable of injesting large quantities of this bacillus by phagocytosis, and for a considerable length of time the system seems to show little discomfiture, but let the resistance become lowered

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to a certain degree and a localized infection start up; then we may discover symptoms that baffle the most astute physical diagnostician.

It is in such a case as I am about to describe that the dentists who specialize in the treatment of septic oral conditions may be most helpful to physicians. This history was given me by the specialist who has charge of the case at present.

A Case in Practice.

Miss M. F., single, occupation bookkeeper. Age 28. Father and mother died with pneumonia. Two brothers living and well. Past history negative. Present illness: Starting at girlhood, has had attacks of gas in the stomach and bowels. As she grew older these were accompanied with pains in the sides and up and down the back. These attacks might go away for months and reappear at short intervals. Six years ago had nervous prostration and was debilitated for six months. Last April, after overworking, became ill. She then became weaker day by day and there was more gas in the abdomen than ever before. Her appetite became poor and she lost weight steadily until now, when she is about thirty pounds underweight, now weighing about eighty-nine pounds. While she had always been *constipated,* since April she has had a marked tendency to diarrhœa. Her stools changed in character in the way that they were more foul smelling, and of late her menstruations have become irregular, now practically stopped. She has had a slight cough since last spring and gets night sweats. She has been in bed uninterruptedly for twelve weeks.

Physical Examination.

A weak emaciated young girl, very anæmic. Heart and lungs normal. Abdomen very distended with gas. Mouth: A Riggs disease, affecting mostly the lower teeth. Examination of urine: Small amount of albumin. Culture examination of urine shows streptococci. Examination of stool shows a marked streptococci from the Riggs disease, causing a mucosal infection of the intestine and a general infection of the blood system, causing infection of the other organs of the body, namely septicemia.

I was called upon in this case to see what I would be able to do to alleviate the Riggs disease complication, for it was the deduction of the bacteriologist that this case was a streptococcus infection and it was apparent the generating location was in the alveolus. The patient had been running an irregular temperature ranging from 99.3 to 104 constantly for thirteen weeks. She was unable to sit up in bed, and I found great difficulty in operating. At the time of my third operation there has been marked improvement, and I found her for the first time with normal temperature. The pus flow had entirely ceased, and she was able to eat a lamb chop for her breakfast, together with cereal and cream,

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etc. I have the case still under treatment, and a complete cure of the Riggs disease is certain, in fact, I am practically finished with my work. The prognosis is good.

Dr. Rodine, New York.

Dr. Stewart uses for the title of his timely and pithy paper, *"Common Sense in the Treatment of Riggs Disease,"* not perhaps realizing that nothing is so uncommon as common sense about anything—not excepting our discussion of common sense. Yet I am reminded of what Emerson said in speaking of Plato: "A great common sense is his warrant and qualification to be the world's interpreter." Please do not think I am trying to unduly flatter either Emerson or Plato or suggest an analogy.

Another thing to which I would like to call your attention is that Dr. Stewart has changed his mind and reconstructed his ideas about Riggs disease in the last fourteen years. This is a very commendable and noteworthy achievement. Some men pride themselves upon the questionable temperament of never changing their minds. For a human being to exhibit such an intellectual deformity, and also to call attention to a condition of mental ankylosis is a bad precedent to follow.

Co-operation of Physician and Dentist.

Must we go into medicine more than we now do? I hardly think that advisable, as our field is sufficiently great to engage all our attention and energies. Yet I do believe this is a great field for the special dental diagnostician and consultant. I most certainly believe we ought to co-operate with the physician to a greater extent than we hitherto have done, yet the co-operation should not be all on one side. The physician ought to and must co-operate with us more than he has done. Both dentist and physician have lamentably failed and will continue to fail in solving many problems because of the failure of each to seek the other's special knowledge and skill.

The part which diet plays in either the cause or the cure of Riggs disease and other dental disorders to which Dr. Stewart directs our notice looms larger and larger as we look further into the subject. That part of our physiologies which treats of the chemistry of the body or books on physiological chemistry may profitably engage our attention. It was most surprising to me to read in my dusty and forgotten *"American Text Book of Physiology"* the pages about calcium, and to find that they fortify and reinforce McCann in his recent book, *"Starving America."* Startling as the title of this book is, often we need such intellectual dynamite to jar us out of our smug and machine-made ideas and opinions.

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I heartily recommend this book to the few to whose attention it has not been called.

Prof. Gies suggests that he may produce demonstrable proof that there is metabolism going on in the enamel and dentine, which we hitherto have been led to believe were unaffected except by the oral environment. This will be additional reinforcement to McCann's contention, and brings us an idea that such men encourage the possibility of being able to eliminate most of our dental, medical and surgical ills by proper diet.

Further, as we look through so recently published a book as Mallory's "*Principles of Pathologic Histology*," bearing the imprint of 1914, we find on page 120, "*Calcification.*" Here it states that lime salts are very commonly deposited in various homogeneous substances, the products of secretions and degeneration; and as we turn the pages of this book we find on pages 196, 652, 445, 628, 416, paragraphs which compel us to realize the continuity of thought, purpose and principles which underlie our conception of organic, systemic and local pathology. For our failure to realize this, and for our provincial point of view, we have been frequently and recently censured by the East and West, and to-night by the South.

The idea which I gain from this book, perhaps already familiar to you, is that calcification is the most common result of nearly all pathologic conditions. This explains for me the reason why the so-called serumal calculus is found on teeth affected with Riggs disease.

It is the result, instead of the cause, of pathological conditions of Riggs disease. It also explains that hypercalcification of the external layer of the cementum and the apparent density of the teeth in cases of Riggs disease.

In regard to disease beginning in inflammation rather than infection, this seems to me to be but half the truth. It is true that inflammation prepares a fertile field for infection, but it is also equally true that the body's or the tissue's resistance may be so lowered by other causes besides inflammation that the infection starts up an inflammation and makes easy further infection.

Treatment of Riggs Disease.

In regard to Dr. Stewart's method of treating Riggs disease, this is well worth our close and careful consideration. As nothing succeeds like success, and as Dr. Stewart succeeds in the treatment of Riggs disease, in conditions wherein acknowledged experts fail, any commentary of mine would be superfluous were I competent to discuss it. Yet it seems so reasonable and so in accord with my limited experience that I will certainly try to carry out the principles and practice he has given us.

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Vaccine Treatment of Riggs Disease.

In regard to the vaccine treatment for the special and particular cure of Riggs disease having proved of no practical benefit, I feel sure that this coincides with the experience of many of those who have used it and justifies the practice of those who have not adopted it, but have employed other means. Why this is so I believe the opinion of that distinguished physician (British), Dr. H. D. Rolleston, covers the subject so well that I can do no better than quote from his paper, *"Vaccines from the Standpoint of the Physician,"* published in the *London Lancet,* February 7, 1914:

"Curative vaccine treatments must be admitted to have disappointed the high hopes with which it began, and in this respect its history resembles that of most remedies.

"The problem of immunity is so complex that it is highly probable that the technique or practice rather than the principle of vaccine therapy is at fault, and that in time this may be so perfected as to establish the position of vaccines as a reliable remedy. The determination of the injecting micro-organisms is exposed to well-known fallacies and may be very difficult.

"Even with all due precaution, a wrong vaccine may be given and do harm. Possibly the condition of culture or artificial media may so modify the products of the micro-organisms of which the vaccine is composed as to render artificial inoculation far inferior to auto-inoculation. It has thus far been suggested that vaccines should be made from organisms grown on blood or other natural media.

"In chronic local infection of various kinds, such as arthritis and colitis, in which gradual improvement follows vaccine therapy, it is very hard to decide whether the credit is due to the treatment or to Nature unassisted.

"At the present time the results of vaccines are so uncertain that their use appears to be justified only when other more trustworthy therapeutic methods have failed or do not exist."

Further, if I am not encroaching on your patience, I would like to quote from another book, also by two British physicians, who have signally and significiently grasped the importance of the mouth as a source of infection, and the conditions under which we labor and the value of our efforts:

"Chronic Colitis—Herschell and Abraham, 1914. Infection may occur: 1, from the food; 2, from the mouth; 3, from the post-nasal space; 4, from a diseased appendix; 5, from local ulceration.

Infection from Food.

"The mere fact of the patient taking an excess of animal food will usually result in intestinal putrefaction, and we are personally convinced that one of the chief causes of the prevalence of auto-intoxication at the present day is the large excess of animal food over the real requirements of the body indulged in by the majority of mankind.

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Infection from the Mouth.

"It is probably no exaggeration to assert that the commonest factor which determines given cases of atonic constipation will or will not pass into the stage in which it is complicated by colitis is the condition of the mouth. Quite apart from its efficiency as a masticating machine, the presence of centers of pus infection, from which millions of virulent organisms are swallowed with each mouthful of food, must be a constant menace to the integrity of junction of the gastro-intestinal tract. The chief protection which the human body possesses against infection of the alimentary tract is, as Boas first pointed out, supposed to reside in the secretion of gastric juice, which has the power when normal of inhibiting the growth of micro-organisms. But it would seem that this protective power of the gastric juice has been much overrated, for it must be remembered that it is secreted only periodically during the digestive periods; at all other times the stomach is defenseless against the germs, which in a case of oral sepsis are always present, ready to be swallowed with the saliva.

"Furthermore, there are many forms of indigestion in which the gastric juice is altered in composition and is devoid of that amount of free hydrochloride acid upon which depends its anti-bacillary powers. It is much more probable that the chief protection is the resisting power of the organism, since it can be raised by the injection of vaccine by which colitis can be cured.

"Colyer, who has done a great deal of useful work upon the subject, thinks that although the organisms themselves acting upon the normal mucosa of the stomach may be able to give rise to a septic gastritis, it is probable that the chain of events is as follows: The food, imperfectly masticated and incorporated with infected saliva, undergoes excessive fermentation, with the result that sooner or later a catarrhal inflammation is started. The ———— exudates from the inflammation can grow and directly affects the gastric walls. The sepsis from the mouth escapes through the phycric opening and directly affects the bowels. Then we find associated with the septic gastritis symptoms of intestinal trouble, such as constipation and diarrhœa, and possibly some cases of mucous colitis.

"To some authorities, oral or nasal sepsis is of all forms of infection the most virulent in the production of severe degrees of colitis. Such a view may be expressed in a quotation from Pete Daniel, who, after reviewing the various contributory and determining causes of colitis, says: 'Lastly, I state dogmatically that in the case of primary (mucosa) colitis, if the patients are suffering from oral or naso-respiratory sepsis, they almost all develop into the ulcerative or necrotic varieties as a direct consequence of swallowing strepto and staphylococci, otherwise they remain cases of primary mucous colitis unless a blood infection of the colon occurs.'

"Page 72, Diagnosis.

"Examination for any source of infection.

"We have already pointed out that undoubtedly the commonest source of chronic septic absorption is from the mouth, the patient suffering from pyorrhea alveolaris or Riggs disease, and we should here

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strongly impress upon the reader not only the importance of examining the mouth, but also the absolute necessity that he should examine it himself and not trust to the patient's statement that his mouth has recently been examined by the dentist and pronounced sound. While able and conscientious men who, fortunately, form the bulk of the dental profession, are quite alive to the importance of looking for and treating pyorrhea, there are yet some who, actuated by motives of expediency, prefer to ignore it. The treatment of pyorrhea is tedious and not at all pleasant to the patient, who is moreover unwilling to pay such fees as will probably compensate the dentist for efficient treatment. The patient cannot be persuaded that he is receiving value for his expenditure; he has no visible evidence of improvement, to say nothing of his difficulty in appreciating the influence upon his system of a mere local disturbance which causes him no inconvenience.

"When examining for pyorrhea, regard with suspicion any tooth from which the gum is retracted and press with the end of the finger or any smooth, rounded body against the edge of the gum in that situation. If pyorrhea is present, pus will be seen to ooze up around the neck of the tooth. Treat in a similar manner any other tooth around which the gums are reddened if there is no retraction, and finally the top of any gold crown or piece of bridgework. Having established the presence of pyorrhea, it is always an advantage to have some X-ray pictures taken of the alveoli in order to see how much damage has already been done to the process. ——— It may be noticed that a skiagram will demonstrate the existence of pyorrhea alveolaris before it can be detected by any other means. The small pictures obtained show two or three teeth in which can be seen not only the amount of long absorption, but also the presence of ramefying osteitis in the alveolar process."

Such expression of the understanding of the field in which we work is so rare and so noteworthy that I think the dentists of America, in fact, the dentists of the world, owe them some acknowledgment of appreciation.

There are many points in Dr. Stewart's most excellent paper which deserves a more careful discussion than I am competent to give, and I will leave that for those able to do so. I wish to express my thanks to the chairman of your Executive Committee and to Dr. Stewart for the courtesy and the opportunity to listen to and discuss this valuable paper.

Dr. Arthur M. Hunter, Brooklyn.

Recently I heard a man ask in fun, "What was the largest island in the world before Australia was discovered?" No answer was made, and then the questioner said, "Australia." The third man protested that the answer was not correct, because by the term "world" the known world was meant, and the world includes only such parts as were known at that time, or, in other words, that the world really was a state of mind.

To my mind the word "cure" is really a state of mind. The *Ameri-*

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can Dictionary defines the word as "The successful treatment of a disease." It makes no limit on the time necessary for the cure, nor does it place a limit on the time necessary after the successful treatment to establish the cure. It has been said that it takes nine months to make a complete change in metabolism, and I believe that faulty metabolism is the real cause of this disease. The inflammation in the mouth may be either the cause of the faulty metabolism or it may be the result.

If for any cause such a malocclusion, injury or retained food particles start a focus of inflammation, immediately we have altered function through the whole system, for we have insufficient chewing, the carbohydrates are not thoroughly mixed with the saliva, some of the digestion of these are left to the pancreatic juices, the primary flow of gastric juice is not complete, until we have undigested food in the intestines, with the formation of toxins, lactric acid, etc. These are absorbed and carried by the blood to the various organs, and we have an altered saliva which has lost its inherent protective action, and the action on the original lesion is aggravated. If, on the other hand, we start with unbalanced diet or the retention of decomposing food in the intestines, we have the same process ending in the altered saliva, with the loss of the normal action of the same.

To establish a cure we must eliminate the cause. Therefore I believe with the essayist that diet and elimination are very important considerations in the cure of this condition. Are not some of the general practitioners demanding too much of the specialist when they want to know how soon a cure can be established? We are not putting in a piece of bridgework where positive statements can be made.

There is not the slightest doubt that we can control this condition by purely local treatment. We who are treating pyorrheal conditions see that in our practice every day. And we can maintain that control as long as our patients co-operate with us by keeping their mouths clean by means of gum brushing and reporting to us at stated periods. This applies to a very large per cent. of the cases, and very often such control seems like a cure.

A Case in Practice.

I have a case which will illustrate this point. A man about thirty-five came to me with a very bad case. The destruction of bone was considerable, pus from every tooth, and also very badly crowded arches in the cuspid region. Before I started the treatment, a dentist friend told him that the whole attempt was useless; that I was bleeding him; that all I could do was to clean his teeth. And that was all that I did do. But by so doing I eliminated a very bad disease con-

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dition. Now, there is not one point of irritation in that mouth except that which is the result of a fistulous abscess. The patient says that he feels very much better and is keener in every way.

This case was more in what has been called the first stages of the disease, a general inflammation with one or two pus pockets. The deposition of calculus was general and not in any great amount. At the first sitting I planed and polished the four lower incisors and instructed him in the use of his tooth brush. When he returned the next week there was a new deposit on those teeth that was larger than the one that I had removed, but with this difference, this was all above the gum line. He explained that he had followed my directions, and he was as surprised as I was when I showed the result of his work. On inquiry I learned that he had been a sufferer from chronic constipation, and at this time was having a relapse. I immediately advised the return to his course of treatment for that condition. The following week there was no new deposit nor has there been any since.

Constitutional Treatment.

What does the man that depends on local treatment entirely do with a case like that? Does he give hygienic treatment every day? I do not believe that we can take the mouth as a thing apart from the rest of the body and treat it as if it was out in the lot somewhere. Dr. Black has stated that by giving a saline cathartic one can stop the deposition of calculus for a period of three or four weeks, but after that time it will begin again. He also said that by giving a certain diet he could cause the deposition of calculus and predict the time of the commencement of the same.

Use of Medicaments.

I believe with the essayist that it is necessary to not only remove the dead tissue, but we must get rid of the sick tissue also; but I do not believe that it is necessary to use astringents or cauterants or sterilizing agents, such as he suggests. I think that the pain at the time of application and the resultant sensitiveness of those teeth is not necessary. Instead, I believe in bringing to the part a normal flow of blood, and I do it by the patients. I teach my patients gum brushing *à la* Fones, as I heard one man here state it, and I find that method much more efficient than any other could possibly be.

Vaccine Therapy.

The best way to express my opinion of the use of vaccine for this condition is to tell a story that Dr. Fones used in his discussion of a paper on this subject before the Connecticut Dental Society last year. He said: "Without wishing to be discourteous, this method of treatment reminds me of an occasion upon which some people were pro-

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pounding riddles. Some one asked, 'What is it that has no teeth, goes around on two legs and barks like a dog?' No one could guess the answer, and finally the propounder said it was a chicken. The objection was made that a chicken does not bark, and the one who offered the riddle said, 'I know that; I just put that in to make it harder.'"

The man that uses vaccines has to be just as thorough in his instrumentation as the one who does not, and he does not eliminate the pus any more quickly.

I do not doubt that he can get rid of the pus by this method, but so can I by mine. And I do not make the patient feel that he is carrying around half the world on his shoulders, and that world gone wrong, as one of them told me.

I do not agree with Dr. Stewart on the necessity for the use of medicaments in the pockets, and certainly do not believe in the radical treatment which he advocates. It does not seem to be necessary. I am not afraid of the gum healing too soon. I believe with him that thorough instrumentation is necessary.

I depend upon the gum brushing for the curative agent, and to me that seems much better than any medicaments, especially sulphuric acid.

Dr. Stewart. I think all the gentlemen who discussed the paper tried very hard to disagree with me and they could not. I feel thoroughly ashamed, I want to say, of not turning in this paper for discussion. I finished that paper to-night when I should have been eating my supper. I have never before had so many things happen all at once, which interfered greatly with the writing of the paper. I have been fitting up a new office, and in addition to that have had two sick children.

My only object in using the acid, I think Dr. Hunter misunderstood. I do not use it to get rid of any of the soft tissue, but more to attack the surface of the cementum itself. We possibly have not gotten rid of every bit of the bacterial placques. We do not always scrape it as well as we might think we do. Dr. Hunter is perfectly correct in regard to what he thinks about metabolism, and in his remarks as to a cure. I thank you all.

Dr. Voelker. We have listened to four very interesting essays, and undoubtedly they will take up a good deal of space in the official journal. I want to compliment the essayist, and to move a very hearty vote of thanks to him and the gentlemen who have discussed the paper.

Motion carried unanimously.

Adjournment.

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The National Dental Association.

The first meeting of the reorganized National Dental Association was held in Rochester July 7th, 8th, 9th and 10th, and, all things considered, must be pronounced a splendid success. There will, of course, be some who will declare otherwise, but these will mainly include those men who opposed reorganization, and who did not wish to see this meeting compare favorably with those held under the old regime.

In all fairness, however, it must be remembered that reorganization has effected radical changes, and it was not to be expected that the vast new machinery would run at once with as little noise and friction as the old. The executive men in charge were much in the situation of a bicycle rider who suddenly is asked to drive a six-cylinder, seven-passenger automobile. That the new big car ran at all, that it never swerved from the road, and that it arrived at its final destination, are all matters upon which the officers, delegates, local and other committees are to be heartily congratulated.

The House of Delegates.

Perhaps the most entertaining feature, to an onlooker, was the House of Delegates. Their proceedings were both humorous and inspiring. The humor cropped up from two main points of view. It was positively funny to observe the attitude of what may be termed the Old Guard. Some of these tried so hard to boss things as in days of old; others walked around ridiculing all that occurred; while still

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others entered heartily into the new scheme of things and earnestly and successfully used their experience to aid in furthering the true purposes of reorganization. The conduct of this little band of men is much to be extolled; associated as they have been in the minds of many, as constituent parts of the Ancient Order of Little Bosses, they proved at Rochester that they have naught at heart but the rapid advancement of our profession. This was one of the healthiest symptoms noted, and largely contributed to a favorable prognosis as to the future of the association.

The other laughable occurrences, all of which were good-humoredly received, were due to the seriousness with which so many of the delegates pursued the duties thrust upon them by their election to the House of Delegates. Nearly all of the delegates were men who have been connected with their State organizations in executive capacities, and all seemed eager to take part conspicuously. This resulted in many unnecessary resolutions, amendments to resolutions, amendments to amendments, and general debate. All of which was funny, very funny, indeed. But it was serious, too, and the outcome most satisfactory, because it showed that these men were all alive to the importance of the situation; they all have had more or less experience in society management, and in what may be termed practical politics, and it soon became obvious that very few resolutions would be passed without close scrutiny. Only one resolution was adopted which was contrary to the constitution, which is a wonderful improvement over previous records. And even this mistake may prove salutary, as its results are likely to make the members of future Houses of Delegates more cautious.

In spite of these facts, the actual work done by the House of Delegates was in the main well done, wisely done, and will redound to the credit of the association and of American dentistry. After one or two more sessions, when the constitution tinkerers will come to feel that they have soldered up all the leaky places, or when their confreres shall have grown tired of their constant plumbing, and when the delegates themselves shall have become accustomed to the working of the House, there is no doubt whatever that the National Dental Association will be a dignified, well-organized, smoothly running professional body, to which we all may lend our loyalty.

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General Meetings.

The general meetings, held in the large auditorium, attracted crowded houses and attentive audiences. It was fitting that one of these meetings should have been given over to the report of the Research Foundation, but it was unfortunate that two important parts of their announced program were necessarily omitted on account of absence of the invetigators. Nevertheless, this new branch of the association has made marvelous progress in a single year, and Dr. Price and his co-workers have earned a debt of gratitude from the profession at large and should have their financial support.

The third general meeting attracted a remarkably large attendance, in view of the fact that the subjects were purely medical in their nature, for which reason, perhaps, the fourth general meeting was the largest and most successful, the subjects relating to "Root Canal Treatment," by Dr. J. R. Callahan, and a prosthetic paper illustrated with moving pictures by Dr. William A. Giffin.

Section Meetings.

Many perhaps will report that again the section meetings have proven a failure, but such critics are but superficial observers. For the first time in the history of the association the section meetings proved successful, because, perhaps, only just now have we enough specialists in each separate department of dentistry to make such success possible. While, perhaps, no section meeting was packed with people, it is not the crowd that counts so much as the men themselves. Thus, when radiography was under discussion it was noted that the audience included noted specialists in this field, as well as numerous dentists who use the X-ray in daily practice. Before such men the essayist must ever be cautious in his assertions, lest he attract the criticism of those competent to criticise. A scrutiny of other section meetings discovered the same factors present. Therefore it is an easy prophesy that within a brief number of years the section meetings of the National Dental Association will be proportionately as well attended as are those of the American Medical Association.

Clinics.

Much credit is due to the managers of the clinics. There was a splendid showing of clinicians, with work that was worth seeing. The general

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clinics were most entertaining, and distributed around a very large hall, so that crowding was absent. The progressive clinics were well attended and promptly and well conducted. One new style of clinic met with approval. This was denominated "Stereopticon Demonstrations." These were really a series of four lectures illustrated with the stereopticon, each limited to forty-five minutes. The audience remained seated and the lecturers appeared in succession.

Officers Elected.

The House of Delegates numbered about one hundred, and eighty-nine were present at the election of officers, another noteworthy fact. The following men were elected: President, Dr. Don M. Gallie, of Chicago; First Vice-President, Dr. Edw. G. Link, of Rochester, elevated to this position in recognition of his conspicuous services as Chairman of the Local Committee of Arrangements; Second Vice-President, Dr. Louis C. Dotterer, of Charleston, S. C.; Third Vice-President, Dr. E. E. Turner, of St. Louis; Treasurer, Dr. H. B. McFadden, of Philadelphia, and General Secretary, Dr. Otto U. King, of Huntington, Indiana.

A provision was added to the constitution by which the constituent State societies were allotted to districts, so that each district as nearly as possible might contain an equal membership, and from each of these districts one member of the Board of Trustees is elected. The new Board of Trustees are the following: First District, Dr. Waldo E. Boardman; Second District, Dr. H. J. Burkhart; Third District, Dr. Clarence J. Grieves; Fourth District, Dr. Thomas P. Hinman; Fifth District, Dr. Marcus A. Ward; Sixth District, Dr. J. P. Buckley; Seventh District, Dr. Thomas B. Hartzell; Eighth District, Dr. C. L. White; Ninth District, Dr. S. W. Wherry.

Exhibits.

The exhibits occupying and filling a tremendous hall resembled a section of the world's fair, and proved one of the most attractive features of the week, the hall being crowded at all times.

Rochester is a beautiful city, a clean city, a hospitable city, and the association members who were present, about three thousand in number, were well housed, well fed and well entertained. All left for home with the kindest feelings toward Rochester and Rochester dentists.

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Sudden Death of Dr. George Edwin Hunt.

As we go to press we learn with great distress of the sudden death of Dr. George Edwin Hunt. Dr. Hunt was widely known and as widely beloved by the dental profession of the entire world. He was more especially cherished in the hearts of the members of the Delta Sigma Delta Fraternity, in which order he has been an arduous laborer for more than a double decade. In that fraternity he was a Past Supreme Grand Master, and for fourteen years had been the editor of their quarterly journal, *Desmos,* from which position he had but just resigned.

For many years Dr. Hunt had presided at the Delta Sigma Delta annual banquets, and he was again chosen for the post at Rochester, which, most prophetically, he announced would be his "Farewell Appearance." As toastmaster, Dr. Hunt presided with his usual genial and typically fraternal good humor, introducing the many speakers with wit and compliment. At the end, and entirely to his surprise, he was presented with a magnificent silver vase of Grecian design, with ornamentation and inscription in inlays of copper. He was much affected upon receiving this expression of goodwill and appreciation from his fraternity brothers, as were all those present in realizing that he was in a sense retiring from active participation in the work of the order. But none present dreamed that this indeed was his "farewell appearance," and it was a sad message which the telegraph carried over all the country announcing the demise of this much beloved man.

Dr. Hunt was perhaps most widely known in professional circles as the Dean of the Indiana Dental College, an institution justly proud of the record of its alumni, and so far as we know the only dental college in the country whose teaching staff devoted their time solely to their college work.

Dr. Hunt was editor of the *Indiana Dental Journal,* a live periodical while it lasted, and for the past few years had been editor of the familiar little magazine, *Oral Hygiene.*

As a teacher and an editor it will be difficult to replace him. As a friend it will be impossible to efface the memories that ever will cling about the name "George Ed."

We extend heartfelt sympathy to the stricken wife, who was his most cherished possession.

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YES, INDEED, there were several Table Talks at Rochester. The following crisp remarks were caught by our official dictograph which we had installed at the Hotel Seneca. As no names were mentioned none can be repeated. Some folks are cautious that way. They have had their private wires tapped before. "Well," said one voice, a mellow Baritone, "it looks as though re-organization has been accomplished." "Which reminds me," replied a tender Tenor, "of an incident that occurred some years ago. There was a car strike in New York, and I was returning to my home in Brooklyn, when I started conversation with the driver. We had horse-cars then. He was telling me that the Brooklyn men would go on sympathetic strike, if the New York City railroad Barons did not soon relent, 'Because,' said he, 'eight hours is long enough for any man to work,' To which I replied, 'Oh! I don't know. I work ten hours a day myself.' 'Then you're not organized,' rejoined the driver, clucking to his horses. But as you say, we are organized now, and I wonder if that will shorten my hours any."

"YOUR LABORS will be lessened even if your hours remain the same," replied the Baritone. "But that will depend upon yourself. This great reorganized National Dental Association will study out and work out, create and invent, investigate and describe so many newer methods of technique and treatment that none but the dullard will fail to find his tasks easier, his work better, and his profession more alluring. I certainly have faith in this reorganized association, and I always have had. I remember down in Birmingham I overheard a prominent Eastern dentist declaiming against reorganization."

"REVISION, YES!" said he. "But reorganization, that is ridiculous impossible," he declared. "This body is large enough now. If it were larger it would be cumbersome, topheavy. I tell you reorganization is a mischievous, impossible proposition." "At which," continued the Baritone, "I was constrained to speak my little piece. Gentlemen of the East,"

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said I, "Reorganization may seem impossible to you, but I can pick out a few men in Illinois, Indiana, and Ohio, and they will tear down, rebuild, improve and modernize your little old alleged National Society, and paint it outside, decorate it inside, put a mansard roof on it and return it to you a magnificent new edifice. But why should these men do it? You would not know how to live in it after it was all done."

⊠ ⊠ ⊠

"BY THE GREAT HORNSPOON," said another voice, "that was indeed a prophecy. I was over in the House of Delegates this morning, and some of those older men acted as though they had lived in shanties all their lives. They are so awed by the atmosphere of the House of Delegates that they do not say a word."

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"THAT IS SOMETHING gained, is it not," asked the Baritone.

⊠ ⊠ ⊠

OVER AT THE POWERS' HOTEL I did not require a dictograph, being personally present most of the time. I chose that place to live in because there were no politicians there. What did you say?

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THEY CERTAINLY tried to get at the root of things in Rochester. Callahan Rhein and Gillette presented important and most entertaining talks on root canal technique, while Eisen and others explained the values of radiography. Again in the progressive clinic, Elmer Best demonstrated his method of entering, cleansing and filling root canals, all proven with radiographs.

⊠ ⊠ ⊠

THE CLOSING sentences of the splendid discussion of Callahan's paper, contributed by Gillette, made a marked impression. Not having the manuscript I cannot quote verbatim, nor can I hope to repeat his thought in language as choice as his; but as best I can let me give you his message.

⊠ ⊠ ⊠

GILLETTE in closing his discussion said: "The radiographers have convicted the dental profession of gross incompetence in this matter of root canal filling, and the pathologists are declaring that to this faulty root work can be traced disease, chronic invalidism, and even death. And I say unto you, that even though these disasters occur long after you do your work; even though the sickness and deaths cannot be brought so directly to your doors that you may be punished for your sins; even though they may have been sins of omission; with this knowledge of consequences indicated to you as it now is, you cannot go on and remain blameless even in your own minds. Unless you perfect your technique, unless you fill root canals properly or not at all, in the future you will not dare look over your shoulders for fear of recognizing the gibbering spectres that will follow you about!"

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AFTER THAT pleasant little prophecy I was not surprised to find Callahan buried ten deep in a crowd that was begging him to give again the formula and technique of using rosin in root canals. When I first noted the aggregation of men, each with his pencil and pad, for just an instant

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❖ I was afraid that Callahan was giving the history of his life to the
❖ Associated and Local Press, but on second thoughts I knew better than
❖ to class him with those who let the newspapers tell the Dear Public
❖ what a Great Man he is.

⊠ ⊠ ⊠

SIDLING INTO the throng I soon discovered what it was these men were
❖ after, and in order to rescue Callahan I recklessly remarked: "Let him
❖ go boys, and I will print it all in the next talk 'Around the Table.'"
❖ Which you see was a promise, and being a promise must be kept, else
❖ Callahan will lose his life when next captured.

⊠ ⊠ ⊠

I MUST THEREFORE give you Callahan's technique, but first let me once
❖ more remind you that he does not fill the root with rosin. The rosin is,
❖ as he calls it, an "adjuvant." The solid filling is the gutta percha. There
❖ is also chloro-percha, but curiously enough no chloro-percha is *introduced*
❖ in the canal. It is *made* in the canal. Told quickly the method is as
❖ follows. First the rosin solution is introduced to seal the dentinal
❖ tubuli and to aid in sealing the apical formamen. Next a gutta percha
❖ cone is inserted, and this is pumped up and down. In this process two
❖ things occur. Chloro-percha is produced by the solution of the gutta
❖ percha in the chloroform of the rosin solution. At the same time the
❖ cone is slowly reduced in diameter by this solution, each pumping
❖ act driving it further towards the apex.

⊠ ⊠ ⊠

I RECALL that one gentlemen especially asked: "How can you get the thin
❖ solution of rosin up into a fine canal in an upper tooth." As he seemed
❖ to anticipate no trouble with lower teeth, I was tempted to suggest that
❖ for upper teeth the patient should be stood on the head. But we must
❖ not jest.

⊠ ⊠ ⊠

TO INTRODUCE the rosin solution into the canals of upper or lower teeth,
❖ use the finest of the Young Aseptic broaches. This broach is so con-
❖ structed that it will retain the merest whisp of cotton twisted on to it.
❖ Saturate this with the solution and carry it into the canal. Then re-
❖ peatedly withdraw and press in again this broach with cotton, this form-
❖ ing a syringe of which the canal is the barrel, and the broach and cotton
❖ the piston.

⊠ ⊠ ⊠

BUT LET ME quote Callahan's own language in regard to this technique:
❖ "The technique of the rosin gutta percha root-filling is simple, easy,
❖ quick, and sure to seal all tubuli and foramina that are open. To make
❖ the following technique possible a root-canal should be of the general
❖ shape of the fine paper root-canal driers as furnished us by the dealers.
❖ In addition to this general form, have the mouth of each canal a de-
❖ cided saucer shape. This will facilitate the placing of agents or instru-
❖ ments to or near the apical foramen. The first step then is, as nearly
❖ as possible, the complete dehydration of the dentin, using acetone, as
❖ advised by Dr. Prinz, as the dehydrating agent. After flooding the
❖ canal with acetone, use the paper points liberally until the canal is en-
❖ tirely free from moisture. Follow this with warm air. Then hold a

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warm wire in the canal for a minute or two, being careful that the wire is *not hot enough to scar* any part of the canal.

"RIGHT HERE is where many root-canal operations fail. The canals and tubuli must be as dry as it is possible to make them, bearing in mind that it is possible to do damage by overheating the root. Now flood the dry canal with the thin rosin solution. Twelve grains of rosin dissolved in three fluidrams of chloroform, is about the proper formula. Pump it in with a wisp of cotton on a broach. When the canal is full of the solution pass a fine wire or broach to the end of the canal. Work out all the air that may be trapped therein. This is of vital importance.

"SELECT A GUTTA PERCHA cone that is about two-thirds the length of the canal, holding the cone with a fine foil carrier. Pass the cone carefully and surely about half way into the canal, pumping the cone up and down in the canal, usually from forty to sixty times, and as it dissolves in the chloroform, advance the cone farther toward the apex. The pumping motion forces the rosin solution farther into every opening. The chloroform at the same time dissolves the periphery of the gutta percha cone, which, becoming more and more attenuated, slips farther toward the apex, surrounding itself with a mixture of gutta percha and rosin. The rosin seals the tubuli and at the same time causes the gutta percha to stick tight to the pulp walls, and makes the gutta percha more stable and proof against the action of body fluids or substances. If this does not leave the large end of the gutta percha cone at or near the end of the canal, place a small cone along side or on the first one. Then with cold steel plugger points that will go into the canals, gently pack the mass into the canal, using warm air to soften the protruding gutta percha if necessary.

"THIS PACKING forces the semi-fluid (chloro-percha and rosin) into unknown canals and pockets, and at the same time brings the surplus chloro-percha to the mouth of the canal where it may be taken up with absorbent rolls of cotton. If this technique be followed it will be noticed that the chloroform has been used up or very nearly eliminated. In packing the root-filling with the steel plugger the rosin and gutta percha is inclined to stick to the plugger. This can be completely overcome by heating slightly the end of the plugger, then thrusting the instrument into a paraffin cake. The instrument will take up enough paraffin to prevent the contents of root-canal from sticking to the plugger point. Have on the bracket a small glass cap bottle which has been filled with chipped paraffin; the bottle is set in hot water until the paraffin melts down. When this has been allowed to cool we have a cake of clean paraffin enclosed within the bottle, useful in many ways. You may ask: "Do you succeed in filling *all* canals and tubuli to the farthest extremity." "No, only those that are open and dry to the farthest extremity."

ON ANOTHER occasion I barely discerned Rhein completely surrounded by an eager mob of men asking questions about his technique. One particular query was in regard to the use of Schrier's sodium and potassium in root canals, and again I pacified the crowd with a promise to print. But I have given so much space to Callahan (not an inch of which do I regret) that I must ask indulgence until next month for a talk on sodium and potassium.

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[redacted] Dr. Frank L. Sibley.

Whereas, Our beloved member, Dr. Frank L. Sibley, has been removed from us by Divine Providence, it is fitting that we should make a record of his death and express our sorrow over the untimely close of a successful career; and

Whereas, By his genial disposition, estimable character, his skill as a practitioner, and his keen interest in the affairs of this society, he has been a credit to the dental profession; therefore be it

Resolved, That we, the members of the Rochester Dental Society, feeling deeply the loss we have sustained hereby express our appreciation of his friendship and our sorrow that he will never more meet with us in our social pastimes or professional activities; and be it further

Resolved, That these resolutions be spread upon our minutes, and a copy be sent to his widow, and to the professional journals for publication.

EDGAR F. LEWIS,
FRED M. ROOD,
Committee.



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National Society Meetings.

AMERICAN INSTITUTE OF DENTAL TEACHERS, Ann Arbor, Mich, January 28-30, 1915.

Secretary, Dr. J. F. Biddle, 517 Arch St., N. S., Pittsburgh, Pa.

PANAMA-PACIFIC DENTAL CONGRESS, San Francisco, Cal., 1915.

Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

State Society Meetings.

MINNESOTA STATE DENTAL ASSOCIATION, Duluth, Minn., August 6-8, 1914.

Secretary, Dr. Benjamin Sandy, Syndicate Bldg., Minneapolis, Minn.

OHIO STATE DENTAL SOCIETY, Columbus, O., December 1-3, 1914.

Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

WEST VIRGINIA STATE DENTAL SOCIETY, Huntington, W. Va., August 12-14, 1914.

Secretary, Dr. A. C. Plant, 802 Schmulbach Bldg., Wheeling, W. Va.

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Dento Alveolar Abscess.

By A. Berger, D.D.S.
Chief of the Oral Surgery Clinic, N. Y. C. D.

Looking over the current literature of some of our leading dental journals four or five years back, I find that the subject of dento alveolar abscess is treated very much as a negligible quantity, or at least it does not engage the attention which it deserves; and yet alveolar abscess is a dental lesion, which, in its frequency of occurrence, is second only to dental caries. In fact, from the number of abscesses that have come under my observation, I am tempted to say that there are, comparatively speaking, but few mouths in which an alveolar abscess could not be traced at one time or another, caused by either a deciduous or a permanent tooth.

I believe that all the radiograph specialists who are engaged in oral radiography will corroborate me in my statement, that their work in connection with dental radiography consists chiefly in determining the presence, the cause and the extent of an abscess, or the positions of roots and their canals to prevent conditions conducive to the formation of an alveolar abscess.

To further illustrate the preponderant ratio which alveolar abscess bears to other buccal lesions, I will quote the statistics of the various cases that applied for and received treatment at the Oral Surgery Clinic of the New York College of Dentistry, in the years indicated. These

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cases comprise various forms of stomatitis; cysts; tumors malignant, and non-malignant; fractures of the maxillæ; necrosis; maxillary sinusitis, some pyorrhea cases, and buccal manifestations of systemic diseases.

	ABSCESS	FRACTURES	OTHERS
1910—1911	300	212	164
1911—1912	260	135	190
1912—1913	280	121	281

Definition of Dento Alveolar Abscess.

An abscess, which is primarily located in the alveolus of a tooth and is caused by a dental lesion, may be designated as a "dento alveolar abscess."

The cause of a dento alveolar abscess can be traced in the majority of instances, with but few exceptions, to a devitalized tooth containing a decomposing pulp or remnant of a pulp, undergoing a suppurative inflammation. The bacteria active in the process of decomposition and suppuration are infesting the buccal cavity, whence they rapidly find their entrance to an exposed or nearly exposed pulp in a carious tooth; or they may have been sealed into a filled tooth at the time of operation. The activity of these bacteria is often inhibited under these conditions by the antiseptic measures taken, but they will become active again upon the evanescing of the drugs applied.

Another channel through which they may have found their entrance is the apical foramen of a tooth devitalized by traumatism or by some pathologic condition, or into an imperfectly cleansed and filled root canal. From there the bacteria, or their poisonous products, are carried beyond the apical foramen. Here they cause irritation and inflammation of the surrounding tissues, which is followed by the exudation and coagulation of the serum of the blood, forming a nidus of infection. This nidus of infection is combated by the proliferated leucocytes which results in the breaking down and peptonization of these cells and the surrounding tissues, and by means of the pyogenic bacteria are transformed into pus. This is in a confined area and by the physiologic process of repair tissue formation, the pus is pressed upon and forced in the direction of least resistance. This process is called, "Pointing of the abscess."

Causes of Alveolar Abscess.

For the sake of clearness, I will classify dento alveolar abscess under the fewest possible headings.

Dento alveolar abscess..... { Acute / Chronic

Chronic alveolar abscess..... { Fistulous / Non-Fistulous

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The conditions causative in the formation of alveolar abscesses are the following:

1. A devitalized pulp exposed or nearly exposed in a carious tooth.
2. A pulp devitalized from the irritation of a filling inserted over this organ, exposed either by instrumentation or by caries.
3. A pulp devitalized by some constituent or impurity of a plastic filling.
4. Where the pulp is devitalized by the shocks caused by thermal conductivity of large metallic filling.
5. A filling inserted over an infected and unattended pulp.
6. A filling inserted over a devitalized but unextirpated pulp.
7. Where the pulp has been partly removed and the pulp canal but partly filled.
8. Where all of the pulp has been removed and the root canal partly filled.
9. Where an evanescent drug is depended upon as a permanent sterilizer, and applied in a root canal to substitute a filling.
10. Where the root canal filling used is of an absorbing or disintegrating nature, and does not fill the root canal hermetically.
11. A multirooted tooth with one or more of the root canals left unfilled.
12. A broach broken in a root canal, preventing its proper cleansing and filling.
13. Perforation through the side of a root, or through the floor of the pulp chamber of a bicuspid or molar.
14. Broken down roots left in the alveolus.
15. Unerupted teeth.
16. Impacted teeth.
17. Unerupted supernumerary teeth.
18. Erupting third molars.
19. Teeth devitalized by the action of orthodontic appliances.
20. Teeth devitalized by a traumatic injury.
21. Teeth devitalized by advanced pyorrhea.
22. Teeth devitalized through the exposure of the apex of its root or roots by atrophy of the gums and the alveolar process.
23. Teeth devitalized through a pathologic process of the adjacent tissue.
24. Teeth devitalized by some obscure causes.
25. Where some septic substance is forced through the apex.
26. Where a tooth dies under a shell crown.

From the above enumerated etiologic factors we may readily postu-

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late that a normal tooth, normally placed in the alveolus and in the arch. is never productive of an alveolar abscess.

Acute Alveolar Abscess.

An acute alveolar abscess caused by a devitalized tooth in its incipient stages presents symptoms similar to those characteristic of a septic apical pericementitis: a constant, gnawing, throbbing pain in the area, elongation, of the tooth and tenderness upon percussion. In

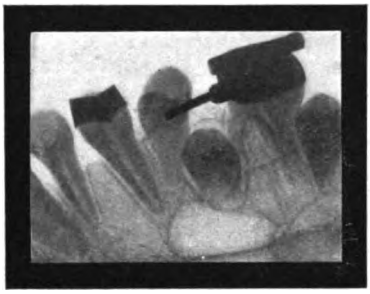


Fig. 1. Abscess of unerupted and partly formed second lower bicuspid devitalised by trauma of orthodontic measures.

the advanced stages the symptoms are not unlike those caused by abscesses in other parts of the body. A constant deep, throbbing pain which is sometimes excruciating; a local and general rise of temperature, redness, swelling, pus and impaired function.

The severity of the symptoms is modified, or, more properly speaking, proportionate either to the extent of the infection, or more often to the amount of resistance offered by the tissues to the pus in its course of pointing. Hence, the symptoms of alveolar abscesses located in the mandible are, as a rule, more severe and of longer duration than those caused by abscesses of the superior maxilla. The reason of this clinical fact is obvious. While the superior maxiila is constituted mostly of cancellous bone within thin plates of compact bone, through which the pus finds a more ready egress into more yielding tissues, the mandible is formed of rather thick, compact bone, in which the roots of the teeth are lodged quite deeply. This condition is most pronounced in the lower third molars. These teeth are most frequently malposed, impacted, or so enclosed in the external and internal oblique ridges, or their roots may be so imbedded in the ascending ramus that the abscesses caused by them often present very alarming symptoms.

Treatment.

The diagnosis having been made and the etiologic factor ascertained, our line of treatment will be materially modified by the consideration, whether the

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offending tooth or root is to be extracted or retained. At all events the evacuation of the pus is paramount. If extraction is determined upon extract at once. By extracting the guilty tooth two steps in our treatment are accomplished: (1) we remove the cause; (2) an outlet is afforded for the escape of pus. For abscesses located in the superior maxilla, where extraction is resorted to, in the majority of cases no other operative measures will be required. Owing to the anatomical relation



Fig. 2.



Fig. 3.

Fig. 2. Partly formed superior left incisor devitalised and abscessed through a traumatic injury with its incisal edge broken off.
Fig. 3. Superior left central incisor with a dowel penetrating through its side.

of the soft tissues connected with and attached to the superior maxilla these abscesses are, as a rule, circumscribed and their evacuation is greatly favored by gravitation. It occurs but rarely that an abscess in the superior maxilla will point so, that an external incision would be necessary, and such procedure is hardly ever, if ever, justifiable. As I have stated above, the extraction of the tooth will almost invariably secure sufficient drainage, and if the pus has penetrated through its bony walls, it is more readily reached by an internal than by an external incision.

Abscesses located in the mandible are, as a rule, more diffused, more complicated, and very often will not be controlled by the extraction of the offending tooth, unless it is taken at an early period. But if the pus once has reached subperiosteal areas, from there it will readily gain entrance into, and is, so to say, invitingly accommodated between the somewhat loose and elastic muscular and subcutaneous tissues and the facia, and will burrow down into the submaxillary triangles. These abscesses while still located between the periosteum and the bone, if incised over the point containing the pus, will respond to treatment very

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satisfactorily, but if the pus once burrows down into the submaxillary triangles, an external incision will be more expedient. Though the pus may be reached from the inside, but an imperfect drainage can be secured in that way.

Abscesses in Mouths of Children.

Too much stress cannot be laid upon the importance and the very particular care to be exercised in abscessed cases of children during the period of the development and eruption of the permanent teeth. Owing to the bone absorption caused by this physio

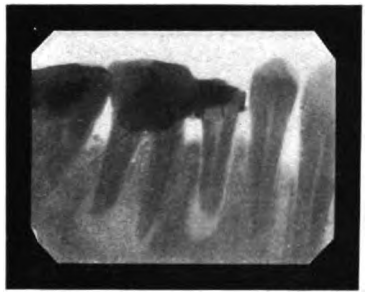


Fig. 4.



Fig. 5.

Fig. 4. Abscessed inferior left first molar with its root canals unfilled and perforation of its distal root with wire passing through it. Also abscessed second bicuspid with unfilled root canal

Fig. 5. Inferior third molar with unfilled root canals causing an abscess. This is the kind of tooth which owing to its position and formation is best out.

logic process, the infection is very readily carried into the deeper areas, which may result in extensive necrosis and the loss of the permanent teeth. At least five cases have come under the writer's observation in which a great part of the body, the ramus, and the condyle of the mandible have been lost through necrosis which originated with a dento alveo'ar abscess.

Surgical Treatment of Abscesses.

Alveolar abscesses, as a rule, point upon the buccal or labial side of the alveolus. In some instances, however, a lateral incisor, a central or cuspid at times, and very rarely abscesses forming upon the palatal root of a superior molar will point upon the palate. Abscesses of the mandible point upon the lingual aspect even more rarely.

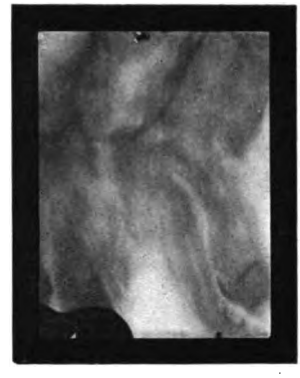
The erroneous idea, that an abscessed tooth should not be extracted before the swelling subsides, is still maintained by some members of the profession. Their argument is that the infection may be carried into the deeper and surrounding tissues through the lacerations caused

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by the extraction. They seem to overlook the fact that by extracting we eliminate the cause, and that we can more readily reach the focus of infection with antiseptic solutions. The clinical truth is, that the extraction of the tooth is almost invariably followed by a very gratifying relief to the patient and subsiding of the symptoms.

When to incise is also a step much discussed in the treatment of an abscess. In the writer's opinion, just as soon as the presence and the location of the pus is determined, an incision to reach the same is justifiable, provided we have decided upon such a course. If we stop to consider the process of pointing of an abscess we will find that the pus





F.g. 6. Fig. 7.

Fig. 6. Abscess of an inferior temporary second molar with erupting permanent teeth. These cases are very prone to necrosis if not assiduously attended.

Fig. 7. Abscess of superior right central incisor which was extracted. Also shows a large area of necrosis containing the lateral and cuspid teeth removed later.

in its progress in the direction of least resistance destroys the tissues before it, and the more destruction of tissue we have the more the patient suffers, and the more marked or unsightly the resulting scar is.

Aseptic Precautions.

Surgical cleanliness should be observed very closely in incising an abscess. Wash the area first with ether or absolute alcohol, or bichloride of mercury solution 1.5000, and then paint it with tincture of iodine. Select the lowest point of fluctuation and make your incision, when opening externally, just large enough to secure thorough drainage. When the pus is reached with the lance and the opening enlarged to the desired size, through this aperture insert a pair of blunt shears and open up within the abscess cavity. By doing so we secure a convenient drainage with a comparatively small outer opening. This procedure is also a safe precaution against injuring some of the impor-

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tant structures when operating upon the neck. Next flush out the abscess cavity with an antiseptic solution, remove all of the infectious material possible and pack it with your favorite dressing. The dressing should be changed at least every twenty-four hours, until we have conditions quite under control. External incisions should always be made with the lines of the features.

Chronic Alveolar Abscess.

Chronic alveolar abscesses may be classified as fistulous and non-fistulous.

The fistulous variety are alveolar abscesses which have passed through the acute stage, and in which the pus has established for itself a point of evacuation either within the buccal cavity, about the root area of the affected tooth or somewhat more remotely or around the gingival margin of the tooth, or externally. The disturbing symptoms are very slight, or none. They usually present a small opening from which the discharge is quite copious and constant in some cases; in others the orifice of the sinus will close up and is burst open by the accumulation of pus from time to time. This is designated by the laiety as "gum boil." At the orifice of these chronic sinuses we may have quite an aggregation of hypertrophied tissues, which gives the appearance of a small epulis. but a slight pressure, as a rule, will cause the exudation of pus, at which point a probe can be inserted within the abscess cavity.

Chronic alveolar abscesses of the non-fistulous variety, may have presented more or less severe or no acute symptoms at the time of their formation or at any later period. They are more often detected by means of the radiograph while seeking information regarding some of the adjacent teeth or when trying to explain some remote or obscure condition. These insidious abscesses are carried about by the patient sometimes for any number of years without their being aware of their existence. Whether this quiescent state is due to an inhibited activity, or whether the pus and the infectious ptomaines formed are so absorbed or carried off by the lymphatic system, I am unable to say. Nor can I say with any sense of certainty what constitutional effect their constant absorption may have upon the patient; whether their effect is cumulative or whether they are eliminated by the proper channels from the system; but I do know that they are accompanied at times with an extensive destruction of the surrounding tissues, involving not infrequently some of the adjacent teeth and rendering them devitalized. When located in the molar area they may find a point of evacuation into the maxillary sinus. I have seen some cases where this condition would hollow out almost the entire superior maxilla, though the offending tooth was a bicuspid or cuspid. At times these dormant abscesses do become active and present all the symptoms of an acute alveolar abscess.

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It is advanced and maintained by some that chronic abscesses or other lesions which are accompanied with a suppurating process such as pyorrhea alveolaris and causative factors in endocarditis or arthritis.

They base their claim upon the clinical experience that patients suffering from the above-mentioned diseases upon the elimination of such septic conditions as abscesses or pyorrhea alveolaris, improve very markedly and the symptoms partly or entirely disappear.

Treatment. Our treatment of these abscesses will be greatly modified by the consideration whether we will extract the offending tooth or desire to retain it. If extraction is decided upon, the removal of the tooth, and subsequent



Fig. 8.

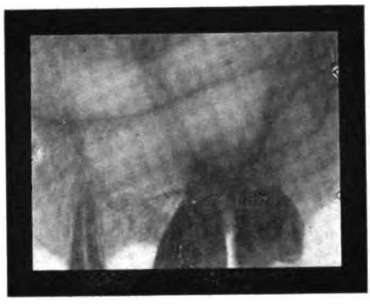


Fig. 9.

Fig. 8. Chronic abscess caused by a portion of the superior right first molar root with an extensive necrosis resulting in the devitalisation of the two bicuspids the second molar and infection of the maxillary sinus.

Fig. 9. A very small portion of a bicuspid root broken in the extraction, causing extensive necrosis and involvement of the maxillary sinus.

antiseptic measures will give good results. In those cases where the necrosed and infiltrated area is considerable, curetting and packing of the cavity is advisable. This also applies to the abscessed teeth of the fistulous variety.

When we desire to retain the tooth, the following treatment in the writer's hands has given very satisfactory results.

Open up into the tooth so as to gain direct access into the root canal or canals, and clean out the same at the first sitting the best you can, and seal into them Buckley's tricresol and formalin. If pus is draining through the root canal, let it remain open for at least the first twenty-four hours. In those cases where the discharge of pus is quite copious, and can hardly be expected to drain through the root canal, another point of evacuation may be secured by drilling through the outer alveolar plate, with a large round burr or with a trephine. At

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the next sitting the root canal should be opened and cleaned out to the apex, and the tricresol formalin sealed in hermetically. Continue this until the root canal is cleaned and reamed out to the apex, and rendered aseptic. Fill the root canal with a permanent filling material, which will seal the apical foramen hermetically, and which is not prone to disintegration, nor to infection by absorption. Should the discharge still continue through the pathologically or surgically formed sinus, root amputation, and curetting will be the resort.

Prognosis.

The prognosis in those cases where extraction is the treatment and the necessary antiseptic measures are properly carried out, is very favorable. It



Fig. 10. Small portion of lateral incisor causing an abscess, with extensive necrosis which penetrated to the nasal cavity.

is really surprising how some of these very filthy cases will clear up much more readily than a lesser infection would in any other part of the body. Where we desire to retain the tooth, the prognosis is in direct ratio with its antero-posterior location in the arch, with the exception of the bicuspids: the anterior single-rooted teeth, having more accessible root canals, are more readily and thoroughly cleansed and sterilized, and respond kindly to treatment; but the posterior multi-rooted teeth will offer much more difficulties. Some of the roots are so inaccessible or tortuous that it is almost impossible even for the most dexterous operator to cleanse and fill them to the apex. For this reason, in my estimation. the saving of abscessed teeth posterior of the first molars is contra-indicated. I advocate extraction, particularly of the upper second molars on account of the proximity of the roots of these teeth to the maxillary sinus. And since an abscess formation is always accompanied with more or less bone destruction, I prefer the loss of a tooth, to the exposure and infection of this cavity. The statement that all those

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abscessed teeth, the root canal or canals of which can be rendered thoroughly aseptic and filled to the apex, and about the apex or apecies of which all infection can be eliminated, will respond favorably to treatment, is not always true.

In this connection I will describe two operations which ought to be resorted to more often by the dental surgeon in the conservative treatment of abscessed teeth, namely, alveolotomy and root amputation.

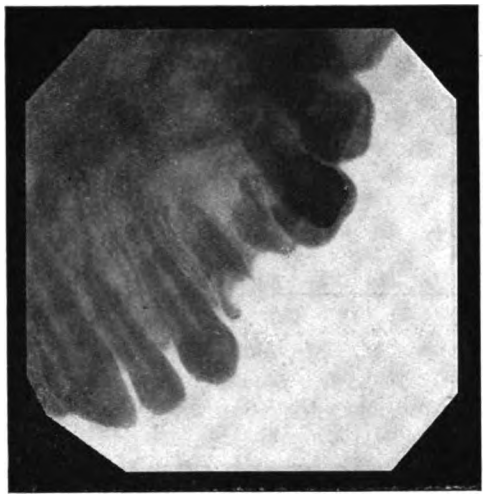


Fig. 11. Chronic alveolar abscess of a superior right first molar which evacuated within the maxillary sinus.

Alveolatomy. Alveolatomy is a much less formidable operation than its name implies: Select a large, round burr and drill through the gums and alveolar process to the apex of the tooth in question. The conditions where this treatment is indicated are as follows: In the incipient stages of abscess formation with symptoms of pericementitis, when the tooth is so tender to touch that we are unable to operate on it; or where we are unable for some other reason such as an obstruction in the root canal to reach the apex and permit the escape of the mephitic gases there confined. Where pus has already formed, but as yet has not penetrated through the alveolar process, we secure a chance for its escape in this way and afford a great deal of relief. Before drilling through the alveolus we may anesthetize the area with a local anesthetic or we may dip the burr into phenol and depend upon the escharotic action of this drug to desensitize the tissues before it.

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Apicoectmy.

Root amputation, in the treatment of dento-alveolar abscesses, is an operation of necessity and not that of choice. Although when properly carried out it almost invariably gives good results, it should be resorted to only when other less radical methods have failed.



Fig. 12.



Fig. 13.

Fig. 12. Shows partly filled root canals of the lateral and cuspid teeth with extensive necrosis about them.

Fig. 13. Shows the root properly filled, the roots amputated and the area of necrosis curetted.



Fig. 14.



Fig. 15.

Fig. 14. Abscess of a superior left lateral incisor in which some drug upon cotton was used for a root canal filling. The extensive necrosis caused devitalisation of the cuspid tooth. This type of cases call for root amputation.

Fig. 15. The same case with the roots amputated and the area curetted.

The conditions where this operation is indicated are the following: Where the area of necrosis is so large, and the infiltration of pus into the surrounding tissues is so extensive, that thorough asepsis cannot be established, and all of the infected and broken down tissues cannot be eliminated by the medicaments conveyed through the root canal or canals

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of the offending tooth. Where a broach is broken in, let us say, the apical third of the root which precludes the possibility of properly cleansing and filling the root, it is good practice to fill the root to the broach and amputate the part containing the foreign body. Multirooted teeth, one root of which has been devitalized by extensive pyorrhea or atrophy of the gums and the alveolus are also good subjects for this procedure. The pulp chamber and the canals of the retained roots should be filled, and the one bereft of its bony support should be amputated.

Before undertaking this operation, it is advisable to have the root canal rendered aseptic and filled, and to secure a good radiograph to show the condition of the root and its surrounding tissues and its position.

Produce a semilunar incision with a sharp lance, cutting through the tissues to the bone, about one-half of an inch from the gingival margin, with its crescent toward the crowns of the teeth. With a periosteum elevator raise this flap of tissue and expose the bone. A small ridge produced by the root of the tooth will usually indicate about the position of the apex. With a surgical burr, a trephine or else with a chisel, remove the bone overlying the apex and expose the same. By doing this we have a clear field of operation, and will avoid such undesirable mistakes as injuring or amputating the adjacent teeth. We can now with a fissure or round burr cut away the portion of the root penetrating the abscess cavity and devoid of its bony support. The stump end should be rounded off and smoothed next with curette or finishing burr and the entire abscess tract curetted out, removing all the débris and infected tissues. Flush out the cavity next, with an antiseptic solution, and dress it so that the edges of the wound can be approximated.

Where the area of infection is not very extensive after a few dressings the wound can be left unpacked, instructing the patient to use an antiseptic mouthwash.

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Dental Restorations for the Best Interests of the Patient.

By Forry Rohrer Getz, D.D.S., New York City.

Read before the Second District Dental Society of the State of New York, January, 1914.

Mr. President, Members and Friends of the Second District Dental Society of Brooklyn: It has always been a pleasure for me to be present at any of your meetings, and to-night I feel honored in appearing before you as your essayist.

A number of months ago I was engaged upon the most difficult part of one of the most discouraging problems in operative and prosthetic dentistry that it has ever been my fortune to meet with in the course of practice. The conditions that I found to exist and the experiences met with in that particular case aroused such an unusual degree of sympathy for the patient and such a feeling of resentment toward the man or men whose lax methods and patently bad practice had produced such an accumulation of evils and distressing conditions for the patient that frequently while working for the patient I came near to saying audibly some things that were more forceful than elegant.

I do not know, and would rather not know, who was responsible for the state of that patient's mouth, and what I have to say is purely impersonal, though inspired by and based upon the actual conditions found in that and other cases, from a number of which I have had slides made that I will show to you later.

I wish to bring out what seems to be a fact, if one may take as

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evidence the states in which many mouths are found, that there are a great many people paying for professional advice and services who reasonably could expect those services to be better; and in order to cover the ground that is in mind, it was necessary to take a subject which in its wording is rather broad, and in which no leads or bypaths will be followed, however tempting they may be for the study and presentation of the details of particular methods or the treatments of special cases. It will cover, therefore, in a general way such ground only as lies within the limits of every-day, general practice, going into the special branches of dentistry only as they enter into the correction of conditions and the treatment of a case as a whole with a view to possible future developments by unavoidable losses, and laying a little more emphasis perhaps upon the crown and bridge part of prosthetic dentistry.

Under such circumstances no sharp and distinct lines can be drawn between what constitutes the treatments and restorations of operative dentistry and what enters into prosthetic replacements, or the things that orthodontic considerations require from these two branches, because in the mouth all of these are correlated and intimately associated in a common service, where fillings, pulp work and root-canal treatment and filling become just as much a part of good prosthetic dentistry as they are of operative—indeed, more so, for I would rather have a dying or dead pulp to deal with under a filling than under a bridge abutment.

Early and Prompt Dental Attention Recommended.

As many of the conditions presenting at adult age and later life, and needing prosthetic restorations, originated in the neglect of the deciduous and first permanent teeth, a few trite statements are in place. The deciduous teeth should be cared for, properly filled and retained in the jaw until they are lost naturally, or until extraction becomes necessary to make room for the oncoming permanent teeth.

With the appearance of the permanent teeth, especially of the lower molars and bicuspids, the most painstaking vigilance should be exercised to find and stop the beginnings of caries, as one of the best means, not only of preserving the individual teeth, but of guarding against the necessity of future prosthetic restorations and the varied forms of malocclusion that always follow the early loss of these teeth. Therein it may be truly said that "An ounce of prevention is worth a pound of cure."

Occlusal fissures that are deep or open should be cut out and filled early, at such times and in such manner as is best suited for the child. This practice is infinitely better than to leave them until decalcification and discoloration appear, only to find when the tooth is cut into that the infection has followed the tubules, frequently down to the pulp, without

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showing much exterior evidence. A fissure that will barely admit the point of the smallest explorer frequently proves to be the entrance to a veritable little cavern beneath.

The approximal points should be watched and the teeth separated where there is any doubt of the absence of the beginning of decalcification. Where approximal decalcification has begun, extensive cutting and extension for prevention methods in the teeth of children do not seem to be the most conservative. There is nobody who cuts tooth tissue with less compunction than I where radical measures are called for, but in children's teeth heroic measures are not justifiable. Extensive cutting, the presence of large masses of metal or other fillings, have a decided detrimental effect upon the pulp, and only hasten complications that are much too prone in connection with the first permanent molars and bicuspids. Better to keep the cavity preparation within reasonable limits, leave the remaining healthy dentine and enamel undisturbed as long as possible, and if decay does occur, more extensive cutting can be done later with less danger to the pulp and at a time when the patient views the operation more reasonably and is better able to sit through the lengthy operations from which even adults shrink. There is middle ground everywhere, and I do not want to be understood as saying that it is not desirable and wise to insert foil fillings in many cases in the mouths of children, but with the average child the infliction upon his powers of endurance amounts almost to brutality.

Recurrence of Caries.

In this connection I want to make mention of the recurrence of decay under fillings, particularly under occlusal fillings, and perhaps more so in the lower molars. This is frequently spoken of as originating from an area of infected dentine that had not been entirely removed down to healthy tissue. I am constrained to take a different view of this condition. By careful preliminary examination of the outlines of many occlusal fillings of cement, amalgams and gold, I am convinced that in more than half of such cases of recurrence it is traceable to insufficient cavity preparation in not cutting to the limits of the mesio-distal and linguo-buccal terminations of the fissures, where a new starting point is left for decay to work its way down by the side of and under the filling, and to do irreparable damage before it is detected.

Pulp Removal.

In many of these cases of extreme decay and infection, where large masses of filling materials would come very close to the pulp, the best practice is to remove that pulp at once, and follow that up

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with the most careful root canal technique of enlarging, cleansing and filling. I should like to go into more detail if time permitted and show you several sets of burs that I have had made and find indispensable in this work. In many cases it is both desirable and advisable to protect the pulp. It is largely a matter of judgment, and the most important thing is to have the patient, parent or nurse understand that, at the first suggestion of trouble, he must report at once, or go to a dentist if away from home, to avoid much pain, an abscess and possible loss of the tooth.

I admit that there are cases in which pulps may be nursed along and give no trouble for years, but when the trouble does come, sooner or later, with any of the symptoms and states accompanying a dying or dead pulp, the conditions may have already progressed beyond all power of again establishing a clean and healthy state of the root canals and the surrounding tissues and the permanence of such a tooth, and of course of any work upon it in the way of fillings or crowns, is, in many cases, only a matter of the degree of tolerance of the tissues surrounding it. In the main, I am convinced that, in all doubtful cases, pulp removal and careful filling of the root canals is the most conservative practice and will keep such teeth longer and with better final results.

In pulp removal or cleansing of canals in which the pulp has died, the canals in the mesial root of the lower molars and the mesio-buccal root of the upper molars need particularly careful attention. I never refill such teeth or crown them without investigating these canals, which in scores of cases I have found apparently untouched, while the larger and more readily accessible were, in many instances, nicely filled; in others there was anything from gutta-percha, gold, cement, silk fibre, iodoform and cotton, and plain cotton, to wooden pegs and metal pins. History of abscess or chronic abscess existed in the majority of cases.

Restoration of Lost Teeth by Prosthetic Methods.

Progressively, if for any reason a tooth has been lost, and we may take the lower first molar for example, we at once look to the next adjoining tooth for some means of holding the replacement in position by some method which will give the highest degree of present service and comfort, and also ultimately prove to be the most conservative measure in the light of past experience with identical or similar conditions. Let us suppose that the second bicuspid and second molar are perfectly sound and in good condition and position; quite naturally we feel reluctant to do anything to them, but we find also that, by reason of their shape, there is considerable space between their occlusal surfaces and those of the opposing upper teeth. You will agree with me in saying

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that, if we can replace the lost tooth without marring the surfaces of the bicuspid and second molar, it will be the most conservative treatment. This is possible with the clasp form of detachable bridge.

Fig. 1 and Fig. 2 are outside and inside views of such a bridge in

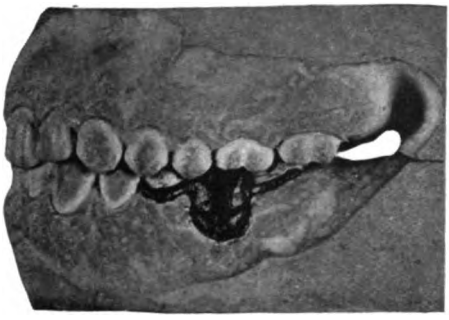


Fig. 1.

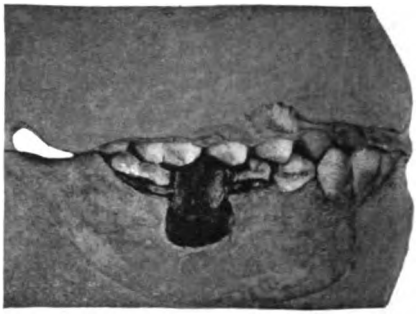


Fig. 2.

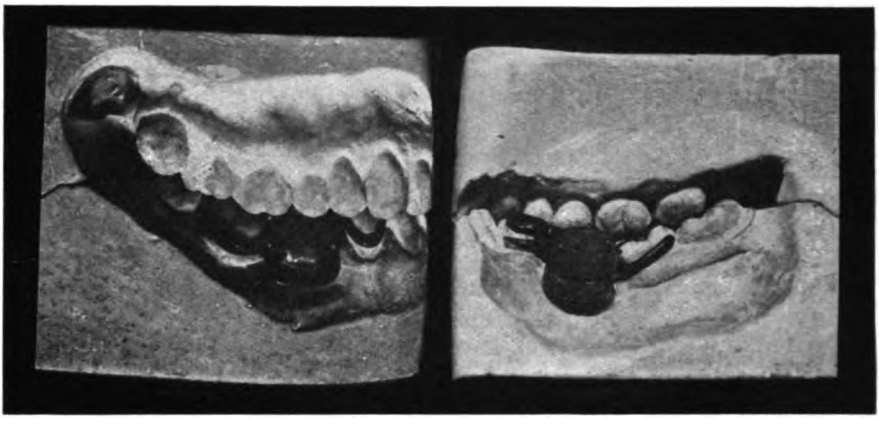


Fig. 3.

Fig. 4.

position. Before this bridge was made, the molar was tipping forward and had rotated about 45 degrees. Nothing was done to either molar or bicuspid except to make a neatly fitting appliance.

Fig. 3 and 4 are illustrations of another case with conditions somewhat different, but involving similar principles in its treatment. The bicuspid was solid, but in infra-occlusion and not favorably shaped for a clasp. The molar was tipped forward and had a large gold filling. Half-round clasp wire was bent to get uniform bearing on the bicuspid and the lug extension made to raise the occlusion. The same was done for the molar, except that in addition a tapered hole was cut into the

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gold filling to receive a small downward extension of the lug to keep the molar in its present position. This appliance has been in most satisfactory service for ten years, with no effect upon the abutment teeth.

Let us suppose that there is a very close articulation between the two adjoining teeth and their opposites. As it happens, more often than otherwise, that these teeth have cavities or fillings already in them, it is



Fig. 5.



Fig. 6.

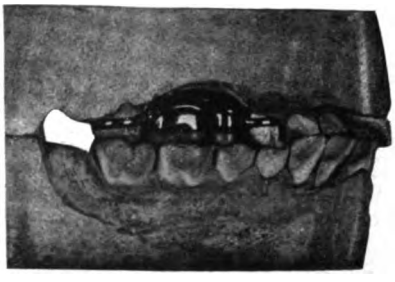


Fig. 7.

a simple matter to adapt the fillings already in place for the bearing points of the clasp bridge, or if they are not of the proper shape, size and material, it is even better to insert foil fillings or cast fillings and shape them in just the manner desired. If, however, as sometimes happens, these teeth have close articulation and are perfectly sound, we are justified in making fillings for the bearing points, because the arguments for a good and efficient masticating apparatus and for maintaining its efficiency, for that as well as for other reasons, by keeping the teeth in their proper normal positions, outweigh any objection to filling the teeth in such a circumstance.

Fig. 5 shows such a case before treatment. There was a gold filling that could be adapted for a bearing place in the molar, but it was necessary to insert a foil filling in the bicuspid.

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Fig. 6 is an outside view and Fig. 7 an inside view with the bridge in place.

The point to be brought out is that any one of these three methods is more conservative than doing nothing, and also more efficient and more conservative than any other of a number of methods that are so

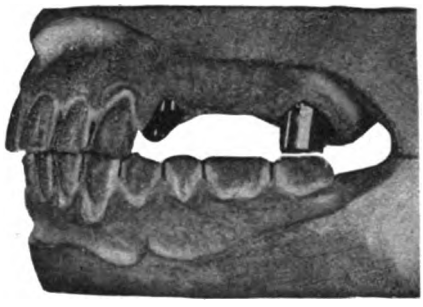


Fig. 8.

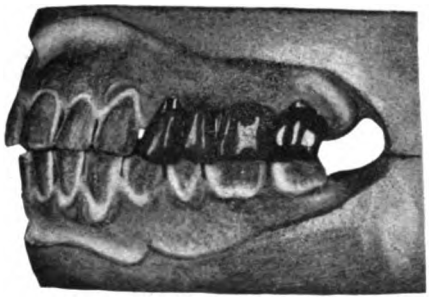


Fig. 9.

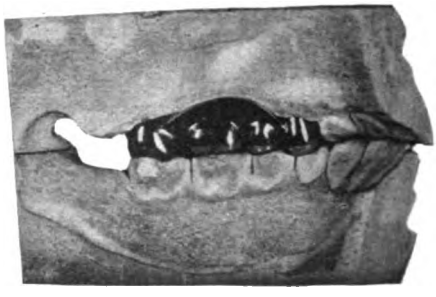


Fig. 10

often employed. The open-face crown still appears, but there is very little excuse for it, and still less for the use of a shell crown over a good tooth. The cast filling or inlay that would be permissible on a vital tooth does not afford the security that is required, especially when anchored at both ends, on account of the mobility of the teeth in their sockets. In devitalized teeth, where pins can be used, there is no objection to the inlay, provided a fixed bridge or appliance is advisable.

In the fourth set of conditions, where these two abutment teeth may be in any state of decay and broken down conditions, the fixed type of bridge is more permissible, but even then my preference is given to the detachable type, particularly if there are conditions elsewhere in the same jaw that are likely to need attention in the future.

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Fig. 8 shows the abutments of a detachable bridge in place on the roots of teeth that would have been too frail to admit of filling.

Fig. 9 is an outside view and Fig. 10 is an inside view of the bridge in place on the abutments.

Fig. 11, Fig. 12 and Fig. 13 show another case and set of conditions before and after treatment. The bridge is detachable; the illustrations



Fig. 11.

are largely self-explanatory. Briefly, the original condition resulted from loss of molar and bicuspid in early youth and the loss of cuspid and lateral in a football accident later in life. The lingual inclination and forward tipping resulting from the first losses made at necessary to raise the occlusion with the bridge abutments on the molars.

In cases where two or more teeth are missing, and with a consequent increase in length of span, the need of additional support to lessen the vertical, external and oblique stresses of mastication upon the abutment teeth becomes more imperative. In this connection I shall use a word which I think all of you will understand, and say that the dynamics of bridge abutment anchorages, *i. e.*, the forces and the directions in which they are exerted upon the abutment teeth and their roots by the bridge attachments need the most careful consideration and forethought in planning a restoration to give the maximum of service.

The type of attachment is a most important part of this, for of a number that may be used for the attachment of a bridge only one may be advisable for a particular condition. The saddle of the detachable bridge very materially reduces the vertical and lateral strains upon the abutments in a unilateral restoration, and even more so in a bilateral restoration. As losses occur by groups and singly in different parts of

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the arch, conditions become more complicated, and in general it may be said that, as the extent of the replacement increases, the arguments for the removable bridge become stronger and more convincing. In extensive cases it has been my habit to make a set of models for study and

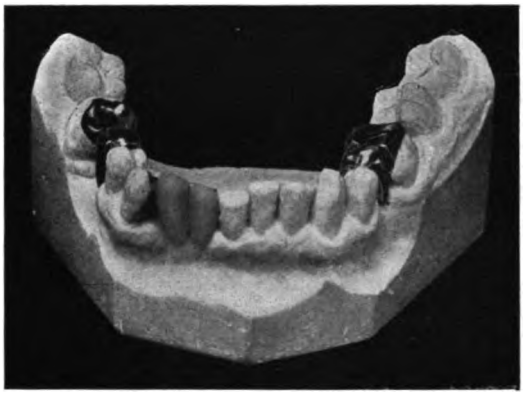


Fig. 12.



Fig. 13.

as a record of the case; these are examined and a tentative plan of action decided upon, subject to modification as new or unforeseen conditions develop in the progress of the work.

In planning work, the state of the patient's general health, age, the state of the mouth and gums, the number of teeth lost, the number remaining, their positions, size, general direction individually and collectively, freedom from caries, their occlusion or articulation with the

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opposite arch, and the degree of recession, must all be taken into consideration, particularly in selecting the kind of attachments to be used.

Prosthetic work, properly performed, is, I dare say, more exacting than operative and not nearly so pleasant, but it has always been my

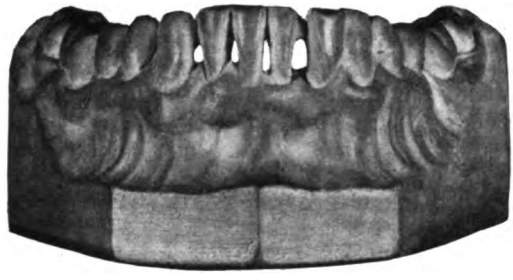


Fig. 14.



Fig. 15.

conviction that this work is not generally done with the interest and care that is devoted to operative work, and is not planned as it should be in connection with operative work. This should not be so, for it is almost as easy to give consideration to the needs of prosthetic restoration while doing a piece of operative work as it is to plan and complete the operation without doing so. There are exceptions among the rank and file of dentists, but generally there is much room for improvement in the character of service rendered to a patient without necessarily making prosthodontia a specialty. A patient who has lost a number of teeth is in need of more sympathy than one who needs a great many fillings, and if there is any time when we are called upon to exercise the very best thought and judgment it is in these cases. It is more than a matter of appearance, it is nutritional and involves health considerations that are paramount, and for those ends it is necessary to retain, within reasonable

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limits, everything in the way of teeth or roots that can be of use, as long as they are not a menace to the adjoining teeth and the general health. I have seen some most remarkable and pleasing results in dealing with some of these unpromising cases.



Fig. 16.



Fig. 17.



Fig. 18.

Fig. 14 and Fig. 15 are interior and posterior views, respectively, of five anterior lower teeth, yoked together. They were and are pyorrheal in their condition. Before treatment the teeth spread out like the petals of a sunflower. Extraction had been advised. They were drawn back into position with an appliance and ligatures, devitalized and united firmly with a fixed appliance, yoke, splint, interdental support, multiple staple, or whatever you choose to call it.

Figs. 16, 17 and 18 are anterior and right and left side views of another pyorrheal case before treatment. Gums anæmic, teeth loosened and out of position. Extension, devitalization, filling yoking and bridge-work was necessary. Unfortunately, through change of residence, I have not been able to make models of the treatment of this case, with the

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exception of the yoke on the three lower incisors remaining, which also carries the restoration for the missing lateral. Fig. 19 is the labial and Fig. 20 the lingual view of the lower incisor.

The work that is involved is, as a rule, exceedingly exacting and unpleasant, but in this matter of service it has always been my feeling that we should give to the patient the same interest, the same services, with the same considerations, and in the same manner and spirit, that we would expect to receive if we were in the place of the patient. That has been my own aim, and there have been no deviations from that course for any consideration of expediency or of personal convenience. To be



Fig. 19.



Fig. 20.

absolutely fair and just in what we do for those that we serve professionally will not only keep the individual standards of work high, but retain to the American dentists the prestige which their thoroughness and resourcefulness and the efficiency of their work in general has won for them.

More is possible to-day than has ever been in all branches of dentistry, and particularly in prosthetic dentistry; specialized and perfected instruments, new and better methods, with the large number of modifications and combinations that are possible, make our work easier, better fitting and more efficient. The principles that Dr. Bonwill and Dr. Peeso have originated and the technique of casting gold and its adaptation to dentistry by Dr. Taggert place in our hands almost unlimited possibilites for the most conservative kind of dental work.

History of an Important Case.

Figs. 21, 22 and 23 show the anterior and the right and left views, and Figs. 24 and 25 the palatal and lingual views of the upper and lower arches, respectively, of the original condition of the case to which I referred in the beginning of my paper. It was taken up January 4, 1912, and was finished September 16, 1913.

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As an actual representation of the evil conditions that can follow in the trail of bad practice in the ordinary and every-day operations of operative and prosthetic dentistry, this case is one of the worst. Criminal negligence about expresses one's first thoughts in viewing it, and there is ample justification for this view, because most of these conditions were preventable. They are not chargeable to the indifference of the patient, for she was neither careless nor delinquent; she went regularly to her dentist, was able to pay and did pay for supposedly good treatment. So far as my information goes, there was not a single redeeming feature for the character of the work in the circumstances surrounding the case. From my first acquaintanceship with it there was only one agreeable feature for me: the optimistic disposition of the patient, whose patience and sunny good temper rarely ever gave way in the most trying circumstances, and helped more toward improving conditions than any confidence in my own ability to bring the mouth back into a state of better health, greater efficiency and a more pleasing appearance.

At the first visit she told me that for a year or more there had not been a week at a time when she did not suffer pain in greater or less degree, or had one of the several fistules discharge into the mouth. Some of the teeth were sore to the touch, some were subject to thermal shock, and the vulcanite partial plate which she was wearing caused almost continuous soreness at one place or another. She could neither bite nor chew her food satisfactorily and had frequent attacks of indigestion. Even in speaking she experienced discomforts that were due entirely to this abnormal state of her teeth.

The condition was too much to grasp at a glance, so I made models of the case, and in the very first operation, that of making impressions, the difficulties that would have to be met and overcome became apparent. The mouth was small and the surrounding tissues inelastic. On the lower left side there was an adhesion of the cheek by a fibrous cord to a point near the second molar, which formed a kind of pocket with the cheek.

The models made from the first impressions were a failure so far as accuracy was concerned, on account of the small size of tray and the numerous undercuts all over the mouth, but served to shape up trays suitable for future work.

Figs. 21 to 25, inclusive, showing anterior, right and left, palatal and lingual views, were made from the second set of models. In removing the tray while making the lower impressions for this set, the inside of the cheek was cut quite deeply by the edge of the tray for a distance of three-quarters of an inch near the corner of the mouth.

A comprehensive conception of the state of the mouth can better

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be conveyed by stating individually the condition of each tooth as found when work upon it was begun.

Beginning at the medial line to right and left, above and below, the conditions in the mouth in question were as follows:

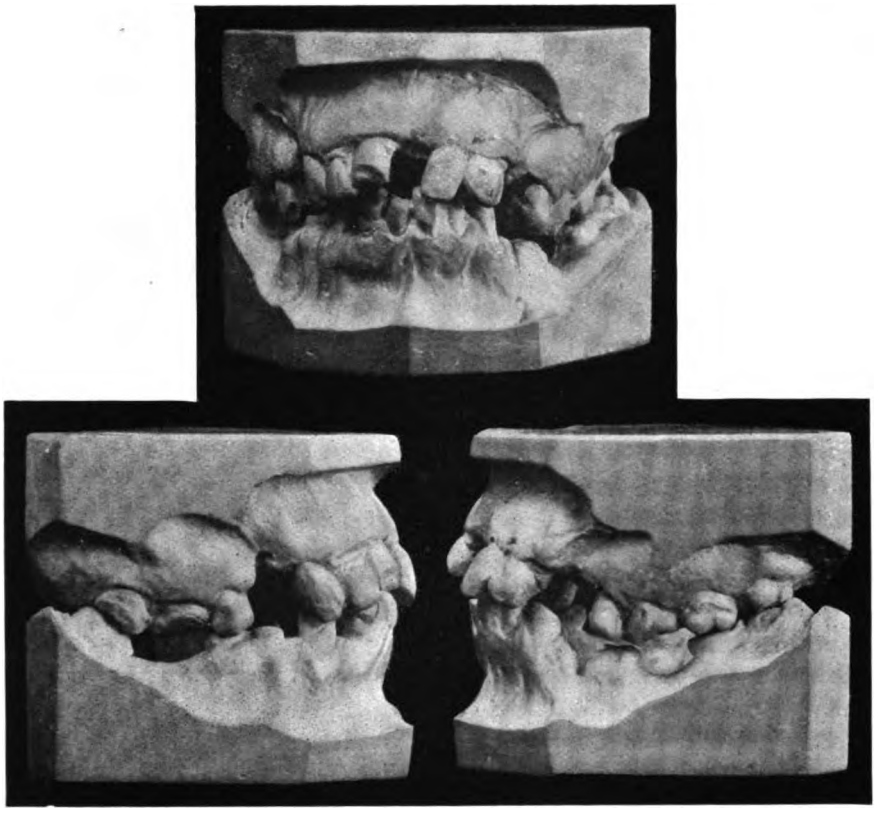


Fig. 23. Fig. 21. Fig. 22

Upper right central had a Logan crown; the pin was exposed by the decay of the face of the root and the breaking away of the cement. When the crown was removed the apical end of the canal was found unfilled and odorous.

Upper right lateral had a Richmond crown and the canal was fairly well filled.

Upper right cuspid was vital; there were large mesial and distal cement fillings.

Upper right first bicuspid was missing.

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Upper right second bicuspid was vital, and had a large mesio-occlusal gold filling.

Upper right first molar had a large gutto-percha and alloy filling in what was only a shell of the enamel and was dead. Two of the canals were filled.

Upper right second molar had large gutta-percha and cement fillings in the pulp chamber, but the canals were open.

Upper right third molar was missing.

Upper left central was missing.



Fig. 24.

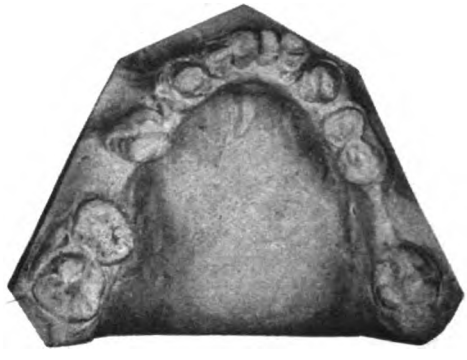


Fig. 25.

Upper left lateral had a Logan crown, cement broken out and root exposed. It had been abominably fitted. The canal above the pin and cement was also unfilled with a large apical foramen. The root had migrated into the space of the missing central and could not be used for attachment on account of its direction.

Upper left cuspid had a Logan crown, also badly fitted and off to one side.

Upper left first bicuspid was missing.

Upper left second bicuspid had a mesio-occlusal gold fill and a distal cavity, but was vital.

Upper left first molar was broken down on the palatal side to the gum line. It had a cement filling in the pulp chamber and the canals were filled with gutta-percha.

Upper left second molar had large buccal and disto-lingual alloy fillings, but the tooth was vital, the pulp much receded and full of nodules.

Upper left third molar had a large occlusal cement filling, a deep buccal cavity and the roots had been imperfectly filled with gutta-percha.

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Lower right central had half of the crown broken away and mesial and distal cement fillings and a lingual opening. The canal was full of malodorous cotton.

Lower right lateral also had mesial and distal and lingual fillings, and the canal was also full of evil-smelling cotton.

Lower right cuspid had mesial and distal cement fillings, but was vital.

Lower right first bicuspid was decayed and broken, leaving only the lower third of the crown. The canal was filled with some sort of chalky substance.

Lower right second bicuspid was also two-thirds gone, but still vital.

Lower right first molar was missing.

Lower right second molar was missing.

Lower right third molar had moved forward and was inclined into the space of the second molar, and was vital.

Lower left central had a bandless porcelain crown, with the cement disintegrated. The apical third of the canal below the pin was unfilled.

Lower left lateral had mesial and distal cement fillings and was vital.

Lower left cuspid had one-third of the crown broken away, but was vital.

Lower left first bicuspid had only the merest shell of the root sticking in the gum, the interior had been softened and disintegrated and had to be extracted.

Lower left second bicuspid was decayed to the gum line. The canal was partly filled. The root was rotated and inclined forward and its buccal and distal sides were denuded for half of its length.

Lower left first molar was missing.

Lower left second molar had a large mesio-occlusal amalgam filling. The root canals were filled with cotton and in a putrescent state. The tooth inclined forward.

Lower left third molar had a mesial cavity, and also a disto-buccal cavity that had enlarged around the margins of an amalgam filling, but was vital.

In addition to this, there was much recession in the anterior part of the mouth and pyrrhoeal pockets. The gums were purple, and over a number of the roots showed the scars of fistulous openings. One of these openings, which was discharging at the time over the upper left first molar, was slow to respond, but when last examined had apparently healed.

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After the poisonous root canal conditions were cleared up, the appearance of the gums improved wonderfully, though, of course, it cannot be expected that they will ever recover from the effects of the long



Fig. 26.

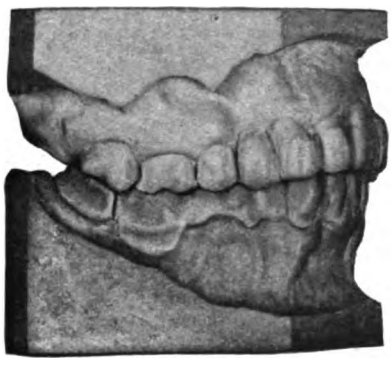


Fig. 27.

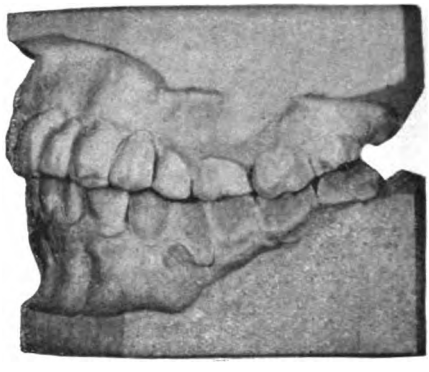


Fig. 28.

period of slow poisoning through the root canals and dentine and the effects of pyorrhoea.

At present there is not a vital tooth in the entire mouth. Every root canal was investigated, treated and filled. Those which were filled, or partly filled, were cleansed, enlarged, treated and refilled before any permanent work was done on the teeth.

As will be seen, the teeth were short and small, and this was another of the difficulties met with in getting attachments. Also it will be noticed that the anterior upper roots are inclined forward and more than ordinarily out of parallelism with the bicuspids and molars. And the curve of the plane of occlusion is pronounced.

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Now, if it is a fair question, where is there a dentist who would like to be in the place of that patient, brought up year by year to a state like that, through no fault of his own, and to find suddenly that he had evidently been badly treated? It is a serious matter, and I confidently

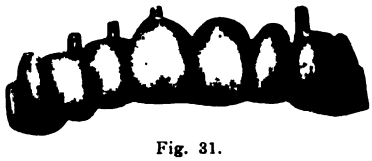


Fig. 31.

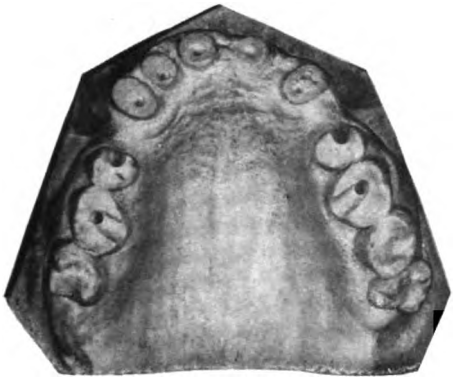


Fig. 29.

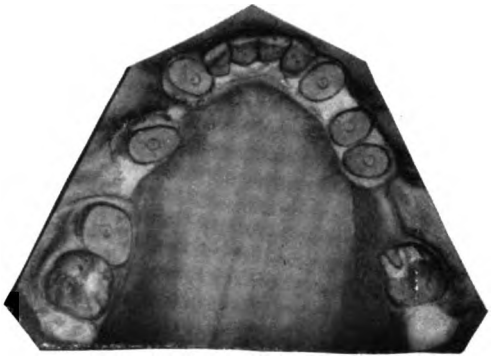


Fig. 30.

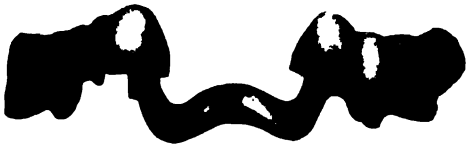


Fig. 32.

hope that, at no very distant time in the history of the profession to come, there will be a very decided improvement in the general average of the advice and service which we are giving to the people, and with more forethought and consideration for the changing conditions of the mouth.

I am making full allowance for the uninformed patient, the indifferent and delinquent patient, financial considerations, etc., and for the things which, with our best efforts, do not always turn out as we would like to have them. There are many things that we would do differently if the same case had to be done again, and the best that we can do is poor

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enough, compared with what the patients need and what we would like to give them.

Figs. 26, 27 and 28 show anterior right and left views, respectively, of the completed case. I want to draw attention to the line of the plane of occlusion and the length of the bite in the bicuspid region of the lower jaw, particularly on the right side. The bite, in this case, could not be opened because of the anterior teeth, all of which were small, and because of the fact that the face, which is of the slender type, would have been made to look long and drawn.

There was also considerable natural discrepancy in the anterior part between the upper and lower arches, and though the teeth in the upper arch have been set back as far as was permissible, there is still something to be wished for in their positions and appearance.

Fig. 29 and Fig. 30 show the remaining teeth and root with the bridge abutment attachments and the crowns in the front of the lower jaw.

Fig. 31 is an anterior view of the upper appliance.

Fig. 32 shows the lower appliance from the front and the form of the sublingual bar that was found necessary on account of the frænulum.

The anterior view of the bridge is shown in this illustration, and the form of the sublingual bar that was found necessary on account of the frænulum.

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Report of the Committee on Improvement of the Teeth of School Children.

By Edwin A. Holbrook, D.D.S., Brooklyn, N. Y.

Read before the Second District Dental Society, February, 1914.

Mr. President, Fellow Members of the Second District Dental Society, and Friends:

Before opening the report, I want to apologize for its meagerness. The length of time which has elapsed between the closing of the last school term and the opening of this meeting, has been too short to obtain all of the records we would like, or to make any thorough investigation of individual cases.

It has been assigned to me as Chairman of the Committee on the Improvement of the Teeth of School Children to tell the purpose for which the committee was appointed, outline its work and report upon the results accomplished to date.

At the February meeting of our society, 1912, Dr. R. Ottolengui suggested that the Committee on Public Health and Education conduct a test with a selected number of school children of Brooklyn, to ascertain to what extent the removal of dental lesions would influence the development of the child mentally, morally, and physically. Dr. Stevenson, Chairman of the Committee on Public Health and Education, recommended that inasmuch as his committee had as much work planned as it could well handle, a special committee should be appointed to engage in this test. On motion, the Committee on the Improvement of the Teeth of School Children was appointed.

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It was first necessary to obtain permission of the Board of Education to select children from the schools and to have access to their records. This permission was obtained through the passage of the following resolution by the Board of Superintendents, the Committee on Elementary School concurring:

"*Resolved,* That permission, as requested by the Second District Dental Society of the State of New York, to examine the teeth of children in public schools of the Borough of Brooklyn, and therein to treat cases of defective teeth, be and is hereby granted, provided the parents give their consent in writing, and the work of carrying out the plan of said society shall in no way interfere with the regular school exercises, and all services rendered shall be without cost to the children, their parents or the Department of Education."

In order to make a proper selection of children and obtain physical records, it was important that we might have the co-operation of the Department of Health. Through Dr. S. Josephine Baker, Chief of the Division of Child Hygiene, we were assured that everything possible would be done to facilitate our work.

Dr. R. H. Willis, Borough Chief of the Division of Child Hygiene, took a personal interest in the test from the start, and has made the accurate health records possible.

The next step was to enlist the services of dentists to treat the children. Eighty-three volunteers promptly responded. Each dentist agreed to fill all cavities of decay as quickly as possible and keep the child's teeth clean and in good repair for one year. Twenty-three of these men also volunteered to assist in making the selection of cases in the schools.

Twenty-three convenient schools were chosen. The Medical Inspectors in these schools were instructed to select a number of children, ranging from eleven to thirteen years of age, with defective teeth, who were below normal mentally and suffering from malnutrition. Care was taken to exclude cases which had physical defects which would not be influenced by oral conditions.

From these children the dental examiners selected three hundred and twenty-seven (327) as being good subjects for the test.

The following letter was sent to the parents of each child:

Dear Sir or Madam:

The Second District Dental Society of the State of New York has obtained permission from the Board of Education to carry on a test

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among the school children of Brooklyn, for the purpose of demonstrating that diseased teeth and unclean mouths have a retarding influence upon the development of the child, both physically and mentally.

The children selected for this test will have their teeth filled and cleaned and kept in repair for one year by some of the best dentists in the city.

The members of the Second District Dental Society hereby respectfully ask your permission to treat your child's teeth. This work is to be done without cost to you, in accordance with the plan agreed upon between this society and the Board of Education.

You will please help us in our effort to make your child's mouth and teeth healthy and clean by having him or her go to the dentist appointed by us promptly at the time set. This will greatly aid us in obtaining the results for which we are striving.

Please sign and mail the enclosed card at once.

Very respectfully yours,

THE COMMITTEE.

E. A. HOLBROOK, D.D.S., Chairman.
W. S. WATSON, D.D.S.
V. A. STOLTZE, D.D.S., Secretary.

We obtained the parents' consent for two hundred and forty-three (243).

On December 1st, 1912, one hundred and sixty four (164) children were assigned to the various dentists, care being taken to send each child to the nearest office. This done, the committee was congratulating itself upon having overcome most of the obstacles in the path of the work, when our several phones began to give out protest from dentist after dentist as the children failed to keep appointments. We had reckoned without the child! Some of these refused to appear for treatment because the dentist was too far; others for the same reason that a great many perfectly normal and intelligent people would give.

Children who did not keep appointments were dropped and others assigned in their places. When this happened several times to one dentist he withdrew, thus cutting down the number of cases we could handle.

In the first assignment, children were selected from our list who had the poorest records. Consequently, when any of these were dropped, their places were taken by children in whom it would be more difficult to make an improvement.

We have been confronted by the same difficulty that invariably obtains when a body of unrestrained children are under observation for the purpose of compiling statistics, namely, the lack of control over the subjects in the test.

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When the final tally was taken one year from date of the original assignment, we had ninety-three finished cases which were treated by sixty-two dentists. These cases were all finished prior to July 1, 1913. Of these ninety-three, eleven children have moved out of town, or left school for other reasons, leaving eighty-two (82) upon whose records we are to form our deduction. A number of the children have been transferred from one school to another, and these eighty-two children are now scattered through thirty-two schools in this borough.

The class records of these children in attendance, studies and deportment for the term preceding the treatment of the teeth have been obtained from the respective school principals. Each child also had a thorough physical examination before treatment by the Medical Inspectors of the Department of Health.

The same class records have been obtained for the school term of five months, ending February 1, 1914. This term immediately followed the completion of dental operations. The second physical examination was made in January, 1914, six months after completion of treatment.

The committee is of the opinion that the records which we will obtain at the end of the present term will be a better index of the values of the services rendered.

It may be of interest before proceeding to an examination of the records of the children to hear what operations the dentists found it necesary to perform.

Amalgam fillings	370
Gold fillings	4
Gold inlays	25
Copper cement	16
Zinc cement	45
Gutta percha	7
Copper amalgam	4
Silicate cement	47
Total fillings	518

Teeth treated root canals filled	70
Crowns	7
Permanent teeth extracted	76
Temporary teeth extracted	83
Cleanings	93

And frequent prophylactic treatment.

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The following are names of the dentists who treated the cases:

Dr. E. A. Babcock	2	*Dr. I. U. Miller	1
" A. P. Boudin	1	* " F. H. Miller	1
" C. A. Bush	1	" E. E. Megaw	2
" H. C. Croscup	2	" A. H. Merritt	1
" W. T. Carpenter	2	* " F. H. Nies	2
" R. W. Collins	2	" C. W. Orr	2
* " H. M. Childs	1	" R. Ottolengui	3
* " R. H. Clark	2	" P. E. Phillips	1
" C. R. Dayton	1	" C. B. Parker	2
" G. E. Davis	1	* " W. H. Rogers	2
* " L. C. Edwards	1	" F. C. Royce	2
* " W. N. Frazer	1	" A. Ritt	1
" J. A. Glenzer	2	" P. R. Stillman	1
" J. A. Gelson	1	" V. A. Stoltze	2
* " G. Gardner	1	" W. Steinbuch	2
" T. P. Hyatt	2	* " A. H. Stevenson	2
* " E. A. Holbrook	2	* " S. Shapiro	1
* " B. L. Hoch	2	* " E. K. Sexton	1
" J. Husch	1	" R. H. Sanderson	2
" E. Hillyer	2	" B. Shapiro	2
* " G. B. Johnson	2	" E. A. Toshack	1
" W. H. Johnston	2	" W. W. Thompson	1
" H. A. King	1	" E. P. Washburn	3
" J. F. Lief	1	" F. C. Walker	1
* " C. H. La Borne	1	" C. B. Whitcomb	2
" O. S. Long	1	" O. F. Wolf	4

I will not attempt to read off the records of each individual case, but will confine the report to totals, believing that presented in this way a more comprehensive understanding of the results accomplished will be obtained.

Dr. A. H. Stevenson, Chairman of the Committee on Public Health and Education, who has been co-operating with this committee from the first, will present a few individual cases of interest later.

No. of cases completed with all records available..... 82

All sub-normal children when selected.

The following tabulation was made from signed forms forwarded by principals:

*Signifies men who help make selections of cases in school.

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GENERAL AVERAGE STUDIES.

No. of cases improved..... 45
(Or 55% of total.)
Average increase per child.....10¼%
No. of cases remaining same..... 10
No. of cases retrograded..... 27

DEPORTMENT.

No. of cases improved..... 28
Average increase per child..... 14%
No. of cases remaining same..... 39
(Most of these were graded A.)
No. of cases retrograded..... 15

DAYS ABSENT.

Term before treatment ..... 586 days
Term following treatment ..... 511½ "

A decrease of ..... 74½ "
Per cent. of decrease..... 12½%

Term before treatment 20 children below 70%, or general average necessary for promotion.

Term after treatment 14 children below 70%, or general average necessary for promotion.

A decrease of 30% in left-backs.

Of six children who were in special classes for backward pupils before treatment, five are now in regular grades and doing very satisfactory work.

HEALTH RECORDS OF CHILDREN IN TESTS PREPARED FROM RECORDS OF BUREAU OF CHILD HYGIENE OF THE DEPARTMENT OF HEALTH.

Cases originally selected 327
Parents consents refused ..... 84 cases
Broken appointments ..... 71 "
Left school, no health or school record or otherwise undesirable ..... 93 "

248 "

Cases completed and health records available..... 79
No. cases of malnutrition before treatment..... 41
No. cases of defective hearing before treatment..... 2

AFTER TREATMENT.

Malnutrition cases improved..... 22
" " cured 17
Ninety-five per cent. cured or improved.
Defective hearing cases improved..... 2

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We have endeavored to make this as nearly a normal test as possible, having relied entirely upon the class work of the children for records. The teachers, for the most part, have not known that certain children were under observation.

The children have not been bribed into being more industrious, neither have they been held to the test by offers of reward.

The only change we have made in their daily routine is in the introduction of the tooth brush, dentifrice, the dental floss, with careful instructions for the use of same.

The committee desires to express its appreciation of the hearty co-operation of the school authorities, Health Department officials and the dentists.

The committee respectfully submits the results herein contained to those who follow in discussion to determine whether or not the removal of dental lesions and the strict application of mouth hygiene have helped to increase the efficiency of the pupil.

We present our findings in the hope that they may show wherein the difficult path of the sub-normal child may be made easier, and the child continue through school without handicap, acquiring its proper quota of knowledge and development.

EDWIN A. HOLBROOK, D.D.S., Chairman.
WALTER S. WATSON, D.D.S.
VAL. A. STOLTZE, D.D.S.

Painless Dentistry.

By ROBERT H. M. DAWBARN, M.D., New York City.

An address delivered before the American Academy of Dental Surgery of New Jersey, Friday, October 31, 1913.

Dr. Dawbarn.

I feel particularly at home among you. For the first two years of my professional existence my time was devoted to the study of dentistry under the late Charles D. Cook, of Brooklyn, where I made many sets of artificial teeth, and made them very badly; but I have never lost my interest in your specialty, and for some fiffiteen years I was an honorary member of the Institute of Stomatology, of New York, and I have always made surgery of the mouth a particular specialty.

In being asked to address you to-night I could think of nothing that would appeal more to you than the subject of painless dentistry, and I hope you will forgive me for not having put it in written form, because

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I am in the habit of speaking extemporaneously, and I prefer to look my audience in the eyes.

I believe you will agree with me that the profession has to face a new phase of affairs in the growing neurotic state of the American people, for more and more do they suffer from pain than formerly. I happened to be present when Mrs. Eddy's dentist remarked that he never filled her teeth without her repeatedly saying to him, "Be sure to use plenty of cocaine." Of course, there was no pain, but she knew when to ask for cocaine! But the American public as a whole are becoming more and more sensitive to pain, and dentists who recognize this and determine to do their work painlessly will reap a great reward.

I purpose to divide the ways in which this can be accomplished under four heads.

First, as to the psychological way. You know as well as I there are many people who simply by their personality and the way they approach the subject can accomplish their work with one-half of the misery that others are obliged to cause.

Second, as to drugs—and they may be administered in certain ways which I will take up later.

The third method is by electricity, used as a vehicle chiefly for drugs. And fourth and last, the wonderful recent development of light as a pain-obtunding agent.

Use of Drugs in Painless Dentistry.

As to drugs, perhaps nothing has been used more frequently in excavating painful teeth than applications of saturated cocaine; and the reason it is not more effectual, as doubtless most of you know, is because cocaine does not work proximally, but only distally. If I were to inject a strong solution of cocaine in contact with the ulnar nerve at my elbow, in a few minutes I could cut off my little finger and not feel it. I could cut into that nerve painlessly at any point distal from the injection; but if I attempted to do it proximally, even the most trifling distance, it would hurt terribly. That is why the first stroke of your excavator takes off the part that has become benumbed, and, because the effect of the cocaine does not work backward, your patient is then as badly off as before. But that is not the proper way to use cocaine. The method in the future for the individual tooth I think without any question will be and is in the hands of a great many men now, the use of a platinum-pointed, very delicate, hypodermic needle, capable of being curved in various shapes, and which can be carried down along the curve of the root to the very tip. There make your main injection, but inject a little as you go along, and then the operation may be made painlessly. Cocaine is being used comparatively

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little now in general surgery because of its relative danger. Yet a great many more patients are having local anesthesia where formerly they had major anesthesia. Locally, perhaps, as good a remedy as I can recommend to you is novocain with a little adrenalin in it. Fifteen minims, dissolving one ordinary tablet, corresponds with the ordinary dose, making a two per cent. solution; and you can inject four or five or six times that amount if you wish to without any danger. If you want a more permanent effect, lasting longer than an hour or so, then you would use quinine hydrochloride with urea tablets for hypodermic use, of from one to three grains. This has a wonderful power of retaining analgesia, benumbing sometimes for as long as a hundred hours. A patient came to me a couple of weeks ago with inflamed external hemorrhoids. A friend of mine, who has been quite a great "pile driver," remarked to me once that this is the only operation he does without ever asking the patient's consent, *i. e.*, simply to open the external pile and turn out a blood clot as black as ink, which is regularly the cause of the trouble. My patient, however, would only permit palliative measures; but I had to use something there, and injected urea and quinine hydrochloride into the base of the pile, and that was the end of his discomfort. Its inflammation came to an end before feeling was restored, some three days later on.

This drug combination is nothing new in the profession. When I was a medical student in '79 and '80, I saw Dr. Loomis in New York use it in treating malaria, and read of Dr. Shoemaker, of Philadelphia, using the same thing, and also Dr. William H. Thompson, of New York, now ex-president of the Academy of Medicine. The reason why urea is used is that the urate of quinine is by far more soluble than even the bi-sulphate. The surprising thing is that none of these keen, able observers who injected it thirty odd years ago noticed that the skin was left benumbed, and applied the discovery to surgery!

In 1887 or thereabouts they began to use cocaine, and before then if a man got a sliver or a cinder in his cornea he had to be put under ether very deeply—enough so to have done a major amputation—yet a drop or two of this solution on the cornea would have enabled them to do the removal painlessly.

I could give you a long list of drugs used for the purpose of benumbing pain. What I use in spinal analgesia is tropacocain. If this has not been used in dentistry, it is high time it was at least tried. It is given by me in the spinal canal—the lumbar region—two grains dissolved in a drachm of normal saline solution, and will produce perfect analgesia from the waist down, lasting on an average one hour at least. Its advantages over cocain are, first of all, that it is very much less

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poisonous. Two grains of tropacocain only equals about one-third grain of cocain. If you inject cocain intra-spinally, you will have vomiting almost always and within a half-hour, and you never get it with tropacocain. When you use cocain you cannot boil it without decomposing it; tropacocain you boil without hurting it, the object being, of course, to sterilize its solution. Its only objection is its expense. It comes in packages of about fifteen grains each, and is rather costly. There are only one or two places in New York where you can get it. I get mine from Merck & Co. Cocain comes from the Andes Mountains in South America. We get tropacocain from the small leafed coca plant of Java; and it is also made synthetically.

Many years ago I devised a method of producing local analgesia in dental work, which was published in the *"Proceedings of the Stomatological Institute"* some fifteen years ago. It is intended for use when several teeth need otherwise painful work at one sitting, such as cleaning the roots, in advanced Riggs disease, as a single instance. Take a syringe such as my spinal syringe (exhibiting syringe), with a needle like that of a hypodermic, only much longer——

Dr. B. Holly Smith. In intra-spinal work, how close can you approximate to the spinal medulla with your needle without danger?

Dr. Dawbarn. The spinal cord, you will remember, does not exist in the lumbar region—unless you dignify by that name the *filum terminale,* which covers only the first lumbar vertebra. You are safe to enter your needle in any part of the lumbar region, for you are entering below the spinal cord.

Dr. B. Holly Smith. But you sometimes go into that spinal column where you know the cord is, do you not?

Dr. Dawbarn. That has been done, but it is poor technique; you are liable to injure the cord, and I have never gone above the lumbar region. The subject is such a big one that it is not worth while now to go very deeply into it.

But this particular needle of mine is made with a very short bevel, and is ground at the end with the tightly fitting trocar or wire in place, so that the end looks solid, until the wire is withdrawn. Thus, and by reason of having the needle only begin its real journey at the bottom of a bistoury puncture through the skin, we avoid risk of conveying particles of skin with its microbes into the spinal canal.

The technique of spinal analgesia is a subject by itself, and I cannot go into it deeply now, unless you want me to. When it was first brought out a good many mistakes were made, as in the early days of the use of chloroform. Most of the doctors were scared off, and only two

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surgeons in New York continued its use to any thorough extent, namely, Dr. Bainbridge and myself. Together with various operators in other cities, we found out what the mistakes were and learned how to avoid them, and in my list of nearly seven hundred cases I have never had occasion to regret using it, although in a few of those cases I had trouble in finding the spinal fluid, or did not succeed in doing so.

Dr. B. Holly Smith. Do you never find paralyses following your operations?

Dr. Dawbarn. Not once. Dr. August Bier, of Berlin, who, after Dr. Leonard Corning, of New York, was the discoverer of it, after using it several hundred times, says that, in his opinion, it is "the safest of all forms of anesthesia." In the Massachusetts General Hospital it has been used almost exclusively for several years in all urino-genital work. If Leonard Corning had been a British doctor he would have been knighted and a pension would have been secured for him. We, as a people, are very ungrateful in that respect toward our discoverers.

To return to our subject, the benumbing of one or other branch of the trifacial nerve to the teeth by hypodermic injection: To affect the inferior dental, controlling it from a point just before its entrance into the canal in the inner surface of the ramus, you open wide the mouth and thereby have abundant space in which to pass your long hypodermic needle in, between the zygomatic arch above and the sigmoid notch of the mandible below. You inject the analgesic agent very close to the nerve, and the effect will last for an hour, or perhaps less, with ordinary benumbing agents; if you combine some urea and quinine hydochloride with it, it will last a much longer time. That is for the lower jaw—upon one-half of it. But if you want only to affect the lower incisors and the canines and the first bicuspids of one side, you inject it in the mental foramen, right under the second bicuspid tooth.

Dr. B. Holly Smith. You strike an artery there.

Dr. Dawbarn. An ordinary hypodermic needle is so small that you need not worry on that score. But it is probably less trouble to benumb the whole inferior dental nerve as first mentioned.

Then for the upper jaw, for the four upper incisors, if you take a two per cent. cocaine solution and moisten absorbent cotton, the size of a dime, with it, and press that against the floor of the nose, you can in a quarter of an hour usually extract these four teeth without pain.

The cocaine works in that case upon the roots of the nerve; it does

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not work backwards, but it does work distally, carried by the circulation down through the anterior nasal canal.

Again, you know that practically all of the teeth back of the first bicuspids in the upper jaw abut against the floor of the antrum of Highmore, and the natural opening of the antrum into the nose is in the middle meatus, where it can usually be seen and probed on its outer wall. This opening being at the junction of roof and inner wall of the antrum, it follows that when pus or irritant mucus forms in the antrum the only way it can drain without surgical intervention and drilling is by the person standing on his head! The human body is full of anatomical blunders—nor am I the originator of that remark. I could give you many instances of the most ridiculous anatomical mistakes made by Nature. The only logical excuse for the appendix, for instance, is that it has been a kind friend to us surgeons! There is no excuse for the existence of the gall bladder—the horse, the elephant, the ass, the rhinoceros and the true deer have no gall bladders, and they enjoy perfectly good health without it, as do those who have it removed. And this is equally true of those who have been deprived of tonsils or adenoids, which are (when enlarged) enemies, not friends, in the economy. Again, what would be thought of a cooper who would make his barrels with the staves on the outside and the hoops on the inside? Such work would obviously not be best for standing strain, and yet Providence has made every one of the tubes or ducts opening into the alimentary canal with this relative position of the longitudinal and the circular muscular layers. These are but a few among numbers of instances known to all anatomists.

Now, coming back to the subject, I was indicating various ways by which you could benumb several teeth at once. You can usually pass into the antrum, through its natural opening, a long, blunt-pointed, curved, hypodermic needle, and through it fill the antrum with any fluid agent you please. But if you prefer using a short, strong needle, you can readily pass it through the wonderfully thin front bony wall of the antrum, just above the gum, and by this route fill it with benumbing solution—to be withdrawn similarly afterwards, your work being finished.

Electricity in Painless Dentistry.

Now I want to take up another phase—electricity. And I think I was first to suggest, many years ago, the use (but not the name) of what has been called "electric cataphoresis"—that is, charging the positive electrode, that is, the anode, with an analgesic agent, non-colloid, in solution, by the shortest route, *i. e.*, from the positive electrode thus saturated to the negative, or cathode, through the part you want to treat.

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Light in Painless Dentistry.

Now in regard to light. Here we have a new field that possibly not all of you gentlemen have had the time to keep up with. For instance, how many of you are familiar with the Menin Light? Dr. Menin is at present the surgeon-general of the Russian Army, and he found this form of light a great improvement over the Finsen rays. His light is in use at the present time in most of the European armies, even including that of Japan, their enemy, whenever they want to do some slight operation painlessly or probe a wound or pass stitches, etc., etc. It has been used for the last few years in the London Dental Hospital for the extraction of teeth painlessly, whenever the patient has time enough to submit to have the light play on the gum for from a quarter to half an hour. It is an exemplification of the effect of that wonderful thing—commonly spoken of in works upon light-therapy as the "Precious Rays"—the ultra-violet rays. I had occasion to use it a few days ago upon a patient suffering from lumbago, who had been in agony for a week or ten days, and everything else had been applied that could be used. It is not the heat that produces the effect, for it is held far enough away to avoid this. In this case it was allowed to shine on his back all night, and in the morning that man got up and took some pennies out of his trouser's pocket and dropped them on the floor, and went around picking them up, just for the pleasure of being able to stoop down and get them without pain! This light is of a deep purple shade, the globe being as large as an orange, or larger, and is used with a reflector of aluminum, eliptical in shape, and can be clamped to a little iron stand, which can be fixed at any angle, and the necessary connection be made by an ordinary plug and cord to any electrical wall socket. This apparatus comes to somewhere about twelve dollars, and can be bought at various places. I procured mine from Beck & Co., at Hammond, Ind. It is called Menin's light. It is not very rapid in operation, but when you have time to have it play on a gum for half an hour you can extract a tooth painlessly, or can thus stop a tooth-ache. It cannot do any harm, and they are using it, as I am telling you, at the London General Dental Hospital.

An Appeal for Better Amalgam Restorations.

By William R. Pond, D.D.S., Rutland, Vt.

Read before the Third District Dental Society of the State of New York at Albany, March, 1914.

When we take into consideration the fact that fully seventy-five per cent. of our filling work is done with amalgam, the importance of this

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material to our profession and to the patients under our care can be more fully realized. With this realization there is bound to come home to us the necessity for a better understanding of this filling material and for an improvement in the technique of its use in dental operations. Also when one observes the careless and slipshod methods employed at times in the use of amalgam and the little understanding there seems to be of the material itself, he is bound to realize the fact that this department of operative dentistry has been sadly neglected. It is to the credit of this society that this important and much neglected subject is being given consideration at its meetings. When a man of Dr. Black's standing and experience states that the amalgam filling is more difficult to make perfectly than the gold, and when Dr. Grieves designates amalgam as "a material that to-day is saving more teeth than any one material in our hands," I feel justified in saying that this is one of the most important subjects before us. We are saving more teeth with amalgam than with any other filling material, and this in spite of the many cases of faulty technique and poor alloys. Imagine what we can accomplish when we perfect our operative procedure and when we have the perfect alloy.

Choice of Alloys.

Let us take up first the question of alloys. As your essayist of last fall, Dr. Crandall, gave a very complete description of alloy making, formulas, ageing, annealing, stress and flow, etc., it seems unnecessary to go into detail on that phase of the subject, except as regards some matters which are still open to discussion.

The alloys most generally used and accepted at the present time are those made from Dr. Black's formula, and the principal contention seems to be regarding the advisability of adding a small amount of zinc (about two per cent.) to the silver, tin and copper constituents. You have been told that the addition of zinc is not permissible in an alloy, and the same statement was made by Dr. Black several years ago. Having used for fourteen years an alloy containing a small trace of zinc, and this alloy having given satisfactoy results, I prefer to have this matter absolutely proved before believing that a small trace of zinc added to the Black formula is not advisable. Dr. Marcus L. Ward says: "Arguments against zinc would hold true if we were considering zinc alone, but why treat zinc as an individual metal when we are discussing alloys any more than we would silver? We can point out some objections to silver if we desire to do so, but no one seems to think that there are any reasons why it is not desirable." Allow me to quote Dr. Ward again when he says: "The real objection to the use of zinc in alloys for amalgam is that those alloys containing it seem to expand more than those without it, and my attitude is to control these expansions by more intelligent manipulation

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(if the manufacturers are unable to control them in the manufacture of the alloys), and by so doing avoid taking a step backward to the alloys of forty or fifty years ago, many of which were as black as coal in some mouths." Personally, I consider the color of amalgam fillings an important question, and until scientific, unbiased tests show zinc to be a mischief maker in alloys I shall continue to be in favor of the alloys containing a small percentage of this metal.

Before leaving the subject of formulas it might be well to mention briefly W. W. Atkinson's alloy, Ag_2 Sn Cu. This formula is based on the theory that the metals are combined chemically in the ratio of their atomic weights. Mr. Atkinson claims that amalgams made from chemically combined alloys do not discolor, for the electrical and chemical affinities are satisfied. The chemical theory of alloys does not seem to meet with general acceptance, and, at least for the present, the contentions in favor of this formula must be entered as not proven.

Balanced Alloys.

Now as to balanced alloys. At the present time the balanced alloys are doubtless the best and most accurate that we have. But to contend that this method of preparing alloys is scientific is rather far fetched, and Dr. McCauley's statement that "The method of making and balancing alloys as discovered by Dr. Black is the only scientific and dependable method which has been introduced up to this time," would rather lead one to wonder how scientific, how accurate and how valuable were his tests made with the commercial alloys. Dr. Black says: "If it were possible to use chemically pure metals, a fixed formula would be possible," and he also adds, "But such metals would be too expensive for use in dentistry." Dr. Crandall says: "Speaking accurately, there are no alloys which are perfectly balanced." Surely, if these statements are correct, the word scientific could not be applied to the method of balancing alloys. The balanced alloys are doubtless the best and most accurate that we have at present, but one cannot but be impressed with the fact that we need real scientific investigation and research to prove or disprove many statements regarding alloys and amalgams; and if we can get scientific formulas by using pure metals and by accurate work, it is surely the duty of the profession to pay more for alloys if necessary. It has been stated that twenty per cent. added to the cost would procure chemically pure metals, and this small advance certainly would not make alloys prohibitive in price. It is safe to say that the reputable alloy manufacturers are as anxious to produce good alloys as we are to have them. If we refused to use the poor and cheap alloys they would soon cease to exist. It is the dentist and not the manufacturer who is to blame, for the manufacturer is only supplying what is demanded of

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him. And here let me say that the manufacturers know more about alloys than do the dentists as a whole. It is a wonderful thing to consider the ignorance of the profession regarding the filling material which is used in seventy-five per cent. of the operations of filling teeth.

Cavity Preparation for Amalgam.

When we come to operative procedure we find many points of difference between operators, but ideas regarding the great fundamental principles, such as cavity preparation, restoring proper tooth forms and occlusion and things of like nature are bound to be similar. Nowhere is the Black system of cavity preparation more applicable than in amalgam work, and with few variations, which I will mention, this form of preparation thoroughly covers the ground. The bevel at the margins should be very long, giving a sharp, clean-cut margin and a strong body of the filling material at this point. In spite of statements regarding the necessity for heavy undercuts and pulp chamber retention for amalgam fillings, I wish to say that little or no undercut is necessary if the filling is cemented in and the typical Black cavity preparation is used. If for aesthetic reasons any frail walls are to be left, they should be well supported by cement. This matter of leaving frail walls is decidedly a variation from the Black system, but according to my ideas is justified (particularly in bicuspid teeth) when the loss of a part of a buccal wall would cause an unsightly filling. Also by cementing in the amalgam, many hopeless looking bicuspids can be made not only useful, but at the same time fairly ornamental.

Use of Cement with Amalgam.

One of the principal points of operative procedure which I desire to bring out is the use of cement in conjunction with amalgam. Those who have never used this method are depriving themselves of one of the most satisfactory methods in dentistry, and those who have followed this procedure correctly will back me up in this statement. Having cemented in my amalgam fillings for fully ten years, I feel justified in making the statement that any healthy tooth, no matter how badly broken down, can be restored with amalgam in this way. I will qualify this statement to the extent of saying that it must be possible to apply a matrix, and if no crown is present, pins must be used. To the man who doubts the strength of these operations I would say: Try to drill out an amalgam filling which has been cemented in. He will find the amalgam must be drilled to the last flake. It might be well to say that this work is best done with slow-setting cement and a quick-setting amalgam. The slow-setting cement is non-hydraulic, and an alloy to be good must be quick-setting.

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Cement used with amalgam has other properties and uses beside that of holding the filling securely. To those who wish to look into this matter more thoroughly I would recommend Dr. Clarence J. Grieves' article, *"The Cement Line in Inlays,"* for many of the points brought out in his paper apply to all cemented-in fillings. Dr. Grieves says, among other things, that the cement acts as a filter, filtering the saliva of the germs in the mouth, preventing decay of enamel. Regarding cemented-in fillings he says: "The cemented-in filling of either crystal gold or amalgam is the greatest thing in dental practice to-day. The line of cement is much finer than can be made by the most expert inlay operator." Dr. Grieves has also made the statement that there has never been a contact operation that did not leak saliva at some point. Of course, we know many amalgam fillings have saved teeth and prevented a reoccurrence of decay by virtue of leaking saliva at the margin and thereby having the salts of silver form. These black, discolored lines and the discolored tooth structure are unsightly and undesirable, and can be prevented and a reoccurrence of decay prevented by the use of lining of soft cement into which the amalgam is worked. While taking up this part of the subject one cannot help wondering if it were not possible that the cemented amalgam fillings would stand Dr. Crandall's air pressure test for leakage better than did his contact operations.

Use of Dam with Amalgam.

Regarding the use of the rubber dam in amalgam operations, I wish to say that I rarely consider it indicated, provided the cotton rolls and saliva ejector are intelligently used and all things arranged for a careful but expeditious operation. Washing the cavity and margins with warm alcohol precludes contamination from the saliva and thoroughly dries the field of operation. Many good cavity preparations extending beneath the gum would be extremely difficult cases for the use of the rubber dam, and a rubber clamp would interfere with the use of a matrix. One of the principal things against the use of the dam is the necessity of *immediate* closure of the jaw to note the occlusion and particularly the movements of the mandible. This must be done at once and before the filling material begins to crystallize, at which time there is great danger of crushing and breaking down a carefully contoured filling. This danger is nil before the filling has commenced to set. The saliva does no damage to the filling material after it is in place.

Use of Matrices with Amalgam.

The use of a matrix is absolutely indicated where one or more walls are to be restored. A little cocoa butter rubbed on the matrix prevents adherence of the cement and amalgam to it. One point

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which is slightly revolutionary I would like to bring out. Except where a matrix is left on (in very large contours) until another sitting, I prefer to finish a filling entirely in the one operation. This point I will illustrate later, but will explain now that the filling burnished and finished while it is setting has a lighter, more attractive and less conspicuous color than the filling polished later with disks and strips. With scalers, files and non-cutting polishing strips the filling can be perfectly finished at one sitting.

A few points we might mention are: necessity for pure mercury and the necessity for a thorough kneading and mixing of the amalgam. Alloys high in silver mix hard. Use filings, not shavings. If the mercury is promptly wrung out, an excess in mixing does no harm. Do not mix too dry. Dr. Black says: "If because of dryness it must be forced together by extraordinary pressure in order to make it cohere, it is apt to make a brittle filling." Use sufficient pressure to make the filling a homogenous mass. The question of instruments we will also consider at the clinic.

Restoration of Proper Forms.

We now come to the point of restoring correct tooth forms, a natural occlusion, and proper contact points, some of the most difficult and necessary points in filling work. The matter of contact points has been so thoroughly gone over and demonstrated by Dr. Black that it only seems necessary to say that amalgam fillings which lack in this respect must be considered failures. This is a weak point with many of our plastic fillings, and a matter we must correct if we would save teeth instead of destroying them. In restoring natural tooth forms and occlusion we must study dental anatomy and understand occlusion. How beautiful and how efficient is normal occlusion and how well worth while it is to produce this perfect condition as nearly as is possible by orthodontic treatment and by our filling restorations. In studying dental anatomy one cannot fail to be impressed with the wonderful tooth forms nature has developed; each plane, each groove and sulcus so perfect in its detail and so efficiently arranged for practical use. How much is lost in efficiency and beauty when we fail to reproduce these natural tooth forms. How much do the polished occlusal flat surfaces of most of our fillings lack. Recent developments in cast inlay work have shown splendid possibilities of reproducing the correct detail of tooth forms in this class of fillings, and unless we can get the same results with other filling materials we should certainly not be justified in using other methods for the bulk of our occlusal restorations. One of the principal aims of this paper is to show that amalgam can be carved to produce as accurate and as artistic results as can be accomplished with the cast gold inlay. I

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trust my lantern slides of clinic models and cases from practice will furnish sufficient proof of this.

In closing this paper allow me to quote again from Dr. Black, who says: "The idea that amalgam is a cheap filling, to be done quickly in 'any old way,' should be discarded forever. The dentist should have the same pay for time in making amalgam fillings as in making gold fillings, and should take the time to do it well." To this very practical thought I should like to add this: How can one consistently demand a good fee for an amalgam operation unless he is willing to use the best alloy money can buy and efficiency produce? Let the demand for cheap alloy cease. Is it not self-evident that if we use amalgam in seventy-five per cent. of our filling operations we are either seventy-five per cent. efficient or seventy-five per cent. deficient, according as we use this material? This is a serious matter, gentlemen, and I appeal to you to raise the standard of this branch of work, to spread the gospel of better amalgam restorations. Educate your patients to expect and to appreciate good amalgam work. Use amalgam, not as a poor substitute called a "silver filling," but as a wonderful filling material which, correctly used, is capable of restoring the efficiency of millions of carious teeth and thereby contributing to the health and happiness of the nation.

Certain Dental Interests in the Internal Secretions.

By George Van N. Dearborn,

Professor of Physiology, Tufts Medical and Dental Schools, Boston; of the Philosophy of Physical Education, Sargent Normal School, Cambridge.

Remarks made March 3, 1914, before the evening class of the Massachusetts Dental Society in the Physiologic Laboratory of the Tufts Dental School.

Dean Painter's invitation to speak to you this evening aroused hopes of demonstrating dental interests in internal secretions, but, like the secretions themselves, the interests of dental doctors in them are more often than not internal, recondite, almost, I might say, esoteric; or so in general I suspect, for most of you realize how complex and how little understood these substances really are.

My remarks will be to you very likely in the nature of a twice-told tale, for I can do as yet truly little more than switch on the current and set the pedagogic physiological mill to grinding a more or less familiar grist. For if some few of the many medical men specializing in dentistry (the so-called dentists—who else?) have of late months developed a high-voltage interest in certain internal secretions, it none the less remains true that the majority of dental specialists in medicine have their

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interests in the internal secretions so deeply buried in their subterranean subconsciousness that not even the "absent treatment" of the late clever Mary Baker Glover Patterson Eddy, or the more scientific detective genius of Morton Prince, or even of Sigmund Freud himself, could discover, much less resurrect it into practical effectiveness. In directer phrase, the dental interests in the internal secretions are apparently narrow, but somewhat deep—in spots.

You will forgive me, then, gentlemen, if I yield to the true physiologist's impulse inherent in the life he studies to talk to whomever will listen—even if he have little that is new to say. Listen, then, for a little and hear the "wheels" begin to turn and creak and then to hum, be the grist wheat or bran!

Even in authoritative discussions on internal secretions, such as those of Biedl, of Howell, and of Sajous, one can find contradictions in a large number of pairs, and the total result in many respects is like unto the total result of research regarding the action of the nervous system: we have a deep-seated desire and much scientific eagerness to know all about it, and a hope that we may some time really understand it at least, but at the present time its mode of action is far beyond understanding. The status of the hormones and koliones is very similar indeed. So if you think you can get any more satisfactory material as a satisfier of your scientific curiosity than that I shall be able to present to you, I wish you joy in trying. I shall eagerly await the new information.

The Parathyroids.

Dr. H. L. Smith, of Lynn, may have something more of much dental interest to tell you about the *thyroid gland* before long, but personally I cannot see as yet any *certain* relationship of undeniable value of the thyroid gland to practical dentistry. None the less, as Dr. Smith showed in his paper read before the Massachusetts Dental Society May 2-4, 1912, delayed dentition certainly appears sometimes promptly to yield to the administration of iodothyrin. On the other hand, the parathyroids are certainly somewhat related to the study and practice of dentistry. The parathyroids were for many years confused with the thyroid gland. There are two pairs of parathyroid glands, one pair behind the upper end of the thyroid gland and the other pair behind the lower end. For many years they were undifferentiated from the thyroid, and frequently in experimental and surgical removal of the thyroid the operators also unwittingly removed the parathyroid. It is only at a comparatively recent date that the parathyroids came to be discerned as glands entirely different and in many respects opposed to the thyroid gland in their functions. They are small, rounded and thin; usually four in number, sometimes more, and consist

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of a solid mass of epithelial cells which secrete a substance apparently not a "colloid," characteristic of the thyroid gland. When all the parathyroidal tissue is removed from the carnivorous animals (including man), the animal dies in from twenty-four to forty-eight hours. It has, however, recently been demonstrated (I forget by whom) that strictly herbivorous animals do not die from removal of the parathyroids. Physiologically, that is a very suggestive fact, and in itself most interesting, but it remains to be explained. The carnivorous animal dies in from twenty-four to forty-eight hours with symptoms of extreme irritation of the nervous system, convulsions, etc., which invariably end fatally.

In 1908, Macallum and Voegthlin showed that the injection of calcium salts counteracts the fatal action of removal of the parathyroids, and that the animal could thus be restored to apparent health, as far, at least, as these particular symptoms were concerned. Calcium salts, then, seem to prevent the toxic action of the removal of the parathyroids, which, therefore, apparently have something to do with the metabolism of lime in one way or another. Bones and teeth may obviously be concerned, but if so we do not know just how. This is all, then, that I have to say about any possible relationship of the parathyroids to dentistry: apparently they are in some way concerned with the metabolism of lime, and the teeth, of course, contain an unusually large proportion of lime.

The Adrenals

We will now consider briefly the *adrenals,* or what were probably more often called when many of you were students the "suprarenal capsules" (a misnomer, because the adrenals in many animals are not "on top of the kidneys," as the name "suprarenal" implies; they apparently have nothing to do with the kidneys). The secretion of the adrenals is adrenalin, or epinephrin, or suprarenin; if you pay your money for it, you may take your choice of names. If you want to be really formal, however, use the term epinephrin; although the term adrenalin is that commonly used abroad, and adremin is best of all.

The injection into the circulation of adrenalin brings about the contraction of smooth muscle fibers, and thus vasoconstriction, wherever it may be, so long as the smooth muscle contains sympathetic nerve fibers in it. There are apparently two functional sets of hormones (the chief chemical materials in the internal secretions) which act on smooth muscle under different conditions, as L. F. Bárker, of Johns Hopkins, has recently set forth. For example, pilocarpin acts only on smooth muscle containing *autonomic* nerve-fibers, while adrenalin, on the other hand, acts only on smooth muscle containing *sympathetic* fibers. The smooth muscle fibers in the arteries contain only sympathetic nerve-fibers, so that adrenalin, as all of you know well, is now commonly used to bring

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about vasoconstriction for the purpose of checking hemorrhage. The difficulty about explaining the function of adrenalin, as that of the other hormones, in detail is largely due to the fact that it appears to work in conjunction with other internal secretions. In the metabolism of carbohydrates, for example, the adrenals seem to act with the thyroid, the pancreas, and the hypophysis, but just how, we do not know; we hope to know soon.

Unless I am in error, one of the "deepest" of the "spots" of dental interest in the hormones is close to the hypophysis cerebri (the pituitary body, "at the base of the brain") and its relation to this very matter of *carbohydrate metabolism,* to which this is an introduction. Let me first then give a brief historical sketch by way of mental orientation.

The Pituitary Body.

Vesalius and Galen supposed that the brain mucus was ejected through the pituitary body; that the brain secreted mucus which was excreted through the pituitary. (The word "pituitary," in fact, comes from the Latin "Pituita," meaning mucus; "hypophysis" means an undergrowth). Later on Sylvius and Vieussens thought that the cerebro-spinal fluid was secreted by the pituitary (a good guess, according to recent research by Cushing and Goetsch). Brown-Sequard formulated the doctrine of internal secretions, and Rogowitsch showed a reciprocity between the thyroid and the pituitary. In 1886, Marie demonstrated a relation between giantism and acromegaly and pathological conditions of the hypophysis, demonstrating that disease of this organ is one at least of the underlying conditions of giantism.

In considering the pituitary we are in a sense always discussing two organs rather than one. Histologically (as Professor Bates has doubtless explained) the body is double; on the other hand, physiologically, it seems to be triple. Anatomically, it is a body about 21x14x5 mm. in size, weighing usually from 56 to 60 c.gms. in men and in nulliparaous women. In women it increases in weight with each pregnancy, 106 c.gms. being an average in women who have borne children, with a noted maximum of 165 c.gms., according to Erdheim and Stumme. The anterior lobe is a hard, bean-shaped mass, somewhat concave behind, and is the true pituitary gland, according to Biedl, as it alone contains true epithelial or gland tissue; it is developed from the ectoderm of the mouth. The posterior lobe is smaller, rounded and soft, and is placed in the concavity of the anterior lobe. This posterior lobe is developed in the embryo from the brain tissue, and all through life is attached thereto by the infundibulum, a prolongation of the tuber cinereum. It contains little or no brain substance, but has connective tissue and neu-

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roglia cells, which together constitute a stroma unusually loose in texture. Most of the mass of the posterior lobe, according to histologists, is of the nature of neuroglia, which is one of the greatest mysteries at the present time of the whole profoundly mysterious nervous system. It is composed of spider-shaped cells, which some used to think were a sort of packing cells (a kind of excelsior!) for the nerve cells; nowadays they are inclined to think that the neuroglia cells are of a truly nervous nature, but how or why or wherefore is all inconceivable. It is not as yet at all certain, however, by any means, that these cells of neuroglia are truly *neural* cells, despite Ramon y Cajal's skilled opinion. The inner or nervous part of the posterior lobe is partly invested by a tongue-shaped extension backwards, called the pars intermedia. It is this latter part of the posterior lobe which supplies the internal secretion (from its epithelial cells), as was described by Herring in 1908. These gland cells (of the pars intermedia) invade the rounded mass of the pars nervosa, and their product (pituitrin or hypophysin) very likely is *actuated* in the nervous lobe, whence it passes on down into the ventricles of the brain and spinal cord. (This supposition was shown to be likely by Cushing and Goetsch, and corroborated by Howell.)

The secretion of the anterior lobe is concerned with the metabolism of bones and of the structural tissues generally, but at present we really have not any idea how. Inasmuch, however, as removal of the entire anterior lobe always causes death in a single day, it obviously has some other and more essential function which is as yet unsuspected.

If we were to summarize briefly the physiological actions of the posterior lobe of the hypophysis, we might suggest them under five heads:

1, Marked increase of the blood-pressure (same action as adrenalin); 2, Slowing of the heart (also same action as adrenalin has); 3, Dilatation of renal blood vessels and an increased secretion of urine (Shäfer & Herring); 4, Galactogogue (stimulation of the secretion of milk, and it is sometimes used for that purpose); 5, Decreased tolerance of sugar, sometimes producing glycosuria (Howell).

We are chiefly interested in the fifth of these apparent functions of hypophysin, the decrease of the tolerance of sugar, and sometimes causing the passing of sugar into the urine. This last function is certainly part of a syndrome, which includes the pancreas, the thyroid, and the adrenals. The internal secretion of the posterior lobe, then, is actuated by the complex apparatus of this lobe and is later on probably absorbed from the cerebrospinal fluid into the circulation. Thus much we have reason to believe scientifically is probable. Some writers, however, are not content to stop here.

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Kirk's Guess Criticized.

Editor E. C. Kirk, of Philadelphia, for example, with all the argumentative skill so conspicuous in editors at times, in a paper before the Toronto Dental Society, November 29, 1913, went quite a way further in hypothesis. This, printed in his "own" magazine, the January, 1914, *Cosmos,* attempts to make printers' ink and hypothesis temporarily take the place of experimental proof. He suggests that dental caries is due indirectly to irritation of the pituitary or hypophysis. Let us run through this hypothetical chain of Kirk's, and remember as we run that a chain is as strong only as its weakest link. I think, however, that there are at least three weak links in this particular gilded chain, and that is one reason why I think it interesting, if not necessary, to take it up and examine it a bit.

Dr. Kirk's first hypothesis is the presence in the normal saliva of a carbohydrate in those people who are especially susceptible to caries.

We all know, of course, that some people seem entirely unsusceptible to dental decay, and so have splendid teeth, and that there are others who more or less continually suffer even from early childhood with a large share of caries. This first hypothesis that he makes (the frequent presence in saliva of a carbohydrate in susceptibles) he had not yet paused to demonstrate. He says its determination (its truth or its falsity) is a matter of fact. Why, then, does he not prove or disprove it? Abderhalden, the productive biochemist, has demonstrated for the first time recently the presence of amino-acids in the blood; he accomplished this important fact only by using many liters of blood, much more than had ever been employed before for this purpose. The same method might show the absence or presence of carbohydrate in the saliva of caries-susceptible people; and plenty of people could be found to furnish saliva in any quantity among the many thousand idle people in Philadelphia. His argument is based on the further hypothesis that if there is excess of sugar in the urine (glycosuria), you would also "get" it in the saliva; that in itself is a gratuitous presumption not very satisfying to a physiologist. So far as I know, at least, sugar never goes into the saliva under normal conditions. The salivary glands and kidneys are very different in structure and in function; there is especially a vast difference in their respective falls in blood pressure, and there is no pressure difference in the salivary glands similar to that in the renal vessels. The work quoted above (by Cushing, Goetsch, and Jacobson) on the relations between pituitrin and glycemia has no word in it of relation between glycemia and the saliva.

Another hypothesis: The tendency to dental caries which is seen sometimes in pregnancy is due to some irritation of the pituitary. It is

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perfectly proper that Doctor Kirk should make such a remark, but what about other causal conditions? We are all aware that women when pregnant are rather more apt to suffer from dental caries than at other times, but there are other conditions that might bring it about. For example, a general katabolic strain (which brings about the appearance of cysts, neoplasms, etc., of many kinds). Or, a disturbance of bone metabolism by a possible action of the *anterior* lobe of the pituitary would be just as good a supposition. Or, the general hyperesthesia of the nervous system during pregnancy might be said to make carious teeth more conspicuous to the patient, thereby bringing her to the dentist's chair more often. The thyroid is well known to be very closely related to the entire generative mechanism, and these varied conditions are much more apt to be due to the thyroid than to a supposed irritation of the pituitary.

Another hypothesis: Stress of dentition irritates the posterior lobe of the pituitary. From Doctor Kirk's discussion of this point one gets the impression that we all pretty much spend our lives, at least up to the eruption of the third molars, with our nervous system literally undermined by dental strain! My experience does not tend to corroborate such a supposition. But as a matter of physiology, the nerve paths of such disturbing influence are not at all obvious and remain to be pointed out. Can Kirk demonstrate any pathway by which dentition would regularly irritate the pituitary's posterior lobe? And what is "stress of dentition," anyhow, however convenient to the theorizer?

Thus a hypothetical "strain" hypothetically is hypothesized by Kirk to irritate the posterior lobe of the hypophysis, which causes a hypothetical glycemia and this a hypothetical glycoptyalism which produces a hypothetical fermentation from which lactic acid by way of bacteria causes caries (without, perhaps, either hypothesis or hypophysis).

None the less, the series of suppositions *may* be true, however unscientifically hypothetical before demonstration. Kirk, indeed, speaks of his paper as a protocol of a research he is now organizing in "the hope of experimentally determining the truth or error of the doctrine set forth." He takes the great editorial privilege of publishing (and as a "leader") a long and concatenated guess; none the less, it may prove years hence to be a good guess, for things reasonably might possibly work that way. Meanwhile we will keep the tooth-brush in the bathroom or the dressing-room within easy reach, and our cortical neurones groping—for *facts*. We will not, moreover, in our teaching, whether of students or of patients, cross this hypophyseal bridge until we are sure it is there.

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Second District Dental Society of the State of New York.

February Meeting.

A regular meeting of the Second District Dental Society of the State of New York was held at the King's County Medical Library Building, 1313 Bedford Ave., Brooklyn, N. Y., on Monday evening, February 9, 1914.

The President, Dr. Lewis, occupied the chair, and called the meeting to order.

The minutes of the last meeting were read by the Secretary, and duly approved.

President Lewis. The subject this evening is one of especial interest to the members of the Second District Dental Society. For a great number of years, the members of this society have been interested in the mouth hygiene movement. I believe that the old Brooklyn Dental Society, which was the parent of the Second District Society—the oldest society in this Borough—was one of the first dental societies, if not the first in the country, to start a movement along this line. It may be a piece of history to some of you to know, that back in 1871 the Brooklyn Dental Society equipped and ran a free Dental Infirmary in this Borough at the corner of Washington and Fulton Sts., I believe. This, like many later efforts, was discontinued after a while.

Then among our members for a number of years we have had one of the fathers of mouth hygiene, Dr. Hyatt, who talked mouth hygiene, and the education of the public and such like things, early and late and

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was laughed at all over the State. Dr. Hyatt is still talking, but he is not laughed at to-day!

Coming down to later times, the Second District Dental Society founded and partially equipped a clinic in the Friendly House, on Warren St., Brooklyn, which was carried on successfully for several years. Then we interested the Brooklyn Bureau of Charities in the work and a Dental Infirmary was opened on Livingston St., and about twenty-five or thirty of our members gave their time and services free for several years.

Finally, through the instrumentality of this clinic, the Board of Health became interested in the work which was being done, and the Bureau of Charities finally turned the equipment of this Infirmary over to the Board of Health. The Board of Health is now running it under the Department of Child Hygiene, and supplying the operators who do the work there. This was the first of the Municipal Clinics to be founded, and there are now several in this city in the different boroughs.

To-night we are to hear a report, but whether that report will be favorable or unfavorable to the work I do not know; but we are all interested to see what that report will be, for great numbers of dentists have felt that the mouth plays a great and important part—especially the mouths of children—and this experiment was really not philanthropic in its motive at all, but merely to see if we could deduce some scientific data to either prove or disprove the theory that the proper care of the teeth must add greatly to the general health of the school child.

(Dr. Holbrook here read the Report of the Committee on the Improvement of the Teeth of School Children, published in this issue.)

President Lewis. Dr. R. F. Willis, Brooklyn Borough Chief, Department of Child Hygiene, Department of Health, will tell us what the medical inspectors found before and after the test.

Dr. Willis. I wish to congratulate the committee upon their splendid work and to say that their results have been a great surprise to me. I have been glad to co-operate with them and to present what the inspectors of my department have found in these cases.

Cases complete and health records available . . . 79 cases. Of these there were 41 cases of malnutrition, of which 17 were cured, 22 improved and 2 showed no improvement; 2 cases of defective hearing, both improved; also 2 cases of hypertrofied tonsils, which were improved.

As far as we could ascertain none of these cases received medical treatment during the period stated in the reports, which makes the results most startling.

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President Lewis. We will now hear from Dr. A. H. Stevenson, Chairman of our Committee on Public Health and Education, who will tell us what the committee have done in some cases.

Dr. Stevenson. To the lay mind statistics do not mean a great deal. I will take a few cases from among these children that may be coincidences, but nevertheless do show improvement in their respective classes. I think both Dr. Willis and Dr. Crampton in their respective departments would uphold me in saying that the biggest difficulty always encountered in conducting a test of this kind in selecting a number of children for even a limited period is to control those children—to keep in touch with them. We have endeavored to do that. How we have succeeded you can see by the comparatively small number we have left from the number originally selected. We have but 82 cases. We had 327. I guess there are a great many members of our society present here to-night who have sad stories to tell of tolerating broken appointments that they would not tolerate from their own patients. To those men I want to say that credit is due them just the same as to those whose children have finally been carried through the final test.

We had 82 children, but I am not going to give you the records of 82 individual cases; just a few typical ones.

Case, I. K. Child was reported to have defective nasal breathing and malnutrition. Dentist reports gums in very bad condition. Five fillings inserted; all but four sixth-year molars broken down to the gum line. All roots of the four molars were filled, one twelfth-year molars partially restored—was gone practically; the entire masticatory apparatus of that child was restored by the dentist.

There was an increase in general school average; child's record for three terms being sixty-five per cent., the term while under treatment, seventy-five per cent. Past six months, ending February 1st, deportment remained the same. Health report: defective nasal breathing improved, malnutrition improved, and the child gained eleven pounds during that year. It may have been a coincidence, but I leave that for your own judgment.

Next case, H. P. A child whose deportment as reported by the principal was such that they made a special comment each time we requested a record; said the child was exceptionally troublesome. We asked for no such information; we simply asked for the child's percentage, but the prinicpal took it upon himself to present this child as troublesome. This child was also reported as having practically all of the molars restored; eleven fillings, four extractions of temporary roots

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that were abscessed. Child's days absent from school, time 65½ days; during the treatment, 7½ days; during the past term, one day absent. General average in studies, same. Deportment increased to seventy-five per cent. Malnutrition improved; slight gain in weight and height.

You have noted probably the two cases that Dr. Willis spoke of, with defective hearing; both these cases were improved. I could go on in this fashion with a number of cases that I have selected and show you the increase, but I am going to show you something of the negative end. There is one case of a boy who was kind enough to come here to-night, and I am going to have him stand here and I will show you the case of a child who has improved a great deal, but the improvement has been due to himself.

How very easy it is to make false statistics or draw false conclusions. Samuel Shagan's case has consistently improved. He has gained forty-two pounds in a year and a half. If we attempted to base our statistics on weight, this one case would so inflate our general average as to make it useless. Eliminating the weight problem entirely, he has consistently improved in his school attendance, his general average in deportment, has been a good disciple of mouth hygiene, and is very comfortable.

You see of what little values the findings would be if averages were made of selected cases and not the whole. I have here 30 cases back from the 82, but if I isolated those the percentage would have been enormous, and look very fine in print and argument. But the committee has simply taken the records from the principals of the schools, and we have also taken the records of the Department of Health.

I have other children here. These children are very proud to come and stand up here and show you what they have done. They have taken hold of this test conscientiously, have realized what this work has meant to them, and have carried out the instructions given them. For very obvious reasons, I am not going into the records of all these children.

Cannot all cases of marked improvement have consistently been cases where the greatest amount of work has been done in the mouth? Where mouth lesions have been cleared up in the greatest number there has been the greatest increase in the average of studies and their health records. Is this a coincidence? We have the sheet here, the record as the examiner in the school made it, showing number of cavities in the child's mouth; accompanying that, the record made by the dentist at the conclusion of the work, showing just what he has done, every dental operation he has performed in that mouth; below, the comments of the dentist on that child. On the other side we have ruled off spaces show-

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ing for the term prior to the test, during the test, and since the test, number of days absent, general average and deportment. Below, the health record before the test and after the test.

All records we have are from the principals and medical inspectors. The report perhaps has not come up to the expectations of a great many men who looked for sensational statistics. It may not have come up to the records of other tests made throughout the country, but the big thing we must remember, after all, is that these children were not isolated from the others, not put in special classes, with special teachers, examined by special physicians and given special tests. We could be more scientific undoubtedly a year after the termination of the dental treatment than we can six months after.

This treatment only ended ten days ago, and all these statistics have been gathered since then. In another term there will undoubtedly be more marked improvements.

I am reminded now of a bit of Chinese philosophy, that if you want something to last ten years, go plant a tree; if you want something to last 1,000 years, plant a habit in a child. We have started these children off right. We have shown them as near as we could the ideal; we have given these children the proper instruction. Let us hope all who see the test will be charitable to our inefficiency, and will remember that we do it all with the conviction that we present what we firmly believe to be the correction of the greatest and most common defect known in the school child to-day.

Dr. C. Ward Crampton, Director of Physical Training, Board of Education.

My relation to this work is rather one of an observer, and I am here to-night merely to find out what the results of this work have been. I believe that this is one of the most significant things that has been done in New York City for the health of public school children for some years. It involves the co-operation of the Department of Education and the Department of Health, but it was begun and put through by a professional organization that demonstrated its professional worth and its social value by conceiving a thing of this sort, and then bending every energy to its successful completion. I beg to congratulate the society upon the work of its members, and I believe that the results of this work will be important.

It is true that we have lacked definite scientific data upon the improvement of children, resulting from improvement in their teeth. This series of data I believe you have supplied. While the figures are modestly stated as being meagre, yet they are definite, and with control will be recognized as of undoubted significance. Exactly what this will lead

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to I do not know. It certainly will lead to more definite care of children's teeth, and a more expansive care of children's teeth.

Condition of Teeth of School Children.

For many years I have been aware of the sad condition existing in the mouths of the children of the City of New York, and have published the results of my investigation from time to time in annual reports. I have found, as you have, in children thirteen and fourteen years of age, an almost total absence of the sixth year molar. I have found scarcely three per cent. of children entering high school with their mouths without blame of some kind, and a very appreciable proportion of such children with mouths that one hardly cares to look into twice; but I was not prepared to find in the six and seven year old children in the entering year of the elementary school, right from the kindergarten, street, or homes, that the sixth year molar in thirty per cent. have broken down—a molar that had not been in the mouth for perhaps an average of a year. This was a great astonishment to me, and I think it merely points in the direction of the necessity for public notice of this important work that you are doing—correlative work.

I am indebted to members of your society for a very deep interest in dental prophylaxis, and I am in hopes that the Department of Education may take some very decided and very expansive steps in that direction. I confess, Mr. President, and gentlemen, to a feeling of stimulation and support that you are giving to the health work of the City of New York, and I am very much impressed with the quality of your scientific results and the quality of the social instinct that has prompted it.

President Lewis.

Superintendent Maxwell of the Board of Education has been very much interested in this test, and I have here a letter from him to Dr. Stevenson, Chairman of the Committee on Dental Health and Education.

(Read letter from Supt. Maxwell thanking the society for invitation, and regretting that he is unable to be present.)

We have with us Dr. John H. Walsh, Associate Superintendent of Instruction of the Board of Education, and we will now ask him to say a few words.

Dr. Walsh.

Some members of an association were once gathered together at the death of a fellow member. They sat quiet for a long time; no one seemed to have the hardihood to say a good word for the dead man. Finally a lady who was in the audience asked if she might, under the circum-

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stances, as there were no remarks being made, take the time for a while to discuss the subject of Womans' Suffrage! (Laughter.)

What I would like to discuss, not knowing anything about dentistry, is truancy from the schools. That is the job I have now. I notice I was down on the programme for discussion, but it is not fair to oppose something that has nothing in it to oppose. The only fault I can find is that you delayed so long in starting it.

Causes of Truancy.

As to the matter of truancy, my attention was first called to three of my own boys, years ago as a principal. I had clubbed them—the rules were not the same then as now. According to one of the Commissioners, the higher branches then were maple, oak, birch and hemlock. One day at one o'clock I saw these three brothers going by, and I said to the policeman: "That's rather brazen; they seem to have no idea of coming in." The policeman told me the mother of these three boys was a drunkard. That meant they had nothing to eat. They were going to an uncle's at a distance, and, of course, could not get back to school that afternoon.

I was interested in another case where a boy was very troublesome along through the grades. He got into the class of a woman friend of mine, and I asked her how this boy behaved. In the other classes, he threw things across the room, kicked his neighbor, and behaved very badly indeed. She found out the trouble was he came to school every morning without his breakfast. Well, after that she brought a double lunch, and his behavior was much improved.

Later on, when I was put in charge of the truancy matters, I tried to find out what was at the bottom of this condition. In my opinion the truant is the only one worth while; he is a fellow of energy; but there is another type of truant, and I wanted to see what was the trouble with him. He is the retarded boy, kept back sometimes; it is too hard. He says nothing; he is seated in the rear of the room, does not seem to hear or pay attention, and he gets a reputation for stupidity that he does not deserve. It may be the teeth are to blame for this.

Take a fellow with a bad mouth; why would he not wander off to the park or somewhere to get away from that ancient lady behind the desk?

I believe that you people have a wonderful influence on the school system in that way, by removing some of these removable causes—some of the things that keep a boy back. The town will save a whole lot of money if the children are pushed forward as rapidly as they can go.

I am glad to see the child coming into his own. The old fashion was to pound the child. We should find out what is responsible for truancy.

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It may be the teeth, it may be the hearing; it may be improper food at home, and we are on the way to learn these things.

For years I have been wondering at the output of stuff from Washington about diseases of the pig, of food for the cow and such things—volume after volume. Very little was said about the child, until recently. Now you are doing a wonderful work, but you are slow, and that is the fault of our big towns. We have all the conceit of size. 'Way out in Oklahoma or somewhere else they can start this movement, and money is furnished. If we want to do anything here, it has to be done by private enterprise, and after you open our eyes then we rush in and want to claim all the credit.

Care of Children's Teeth in the United States.

I cut out of the paper the other day some interesting data about this work in other towns. Mobile, Ala., has dental inspections done by dentists. Eighty-seven per cent. of the school children in New Orleans have defective teeth, and so on. They have a dental inspection staff organized there. The Detroit, Mich., School Board passed resolutions making proper care of teeth a factor of promotion in schools.

It is horribly unfair to professional men that give their time, to have that time wasted on that dental clinic when they take hold of it. Detroit spends about $7,000 a year for dental inspections; we spend nothing. Tulsa, Okla., has local dentists who will make the examinations. It does not say they will do it without pay, but I guess they will, as I note the school board gave favorable action. Children whose teeth need attention in Saginaw, Mich., can go to a dental clinic conducted by dentists. It omits to say at their expense, but it is more than likely. Hammond, Ind., also has dental inspection. It is a shame that our large city has not done something definite, and all I can say is God-speed, and I hope that they will rapidly make it possible for this thing to be done properly and without extraordinary expenditure of their time.

Dr. Arthur H. Merritt.

Several years ago the statement was publicly made that no one thing could be done to raise the standard of public health higher than attention to mouth hygiene. At that time I think the statement was received with a good deal of suspicion, but if we needed any proof of that statement, we have it in the report we have listened to to-night. I think this society is to be congratulated on the splendid work it has done. Few of us realize anything like the amount of work which has been involved in the bringing about of this report which it has been our privilege to listen to.

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I do not know anywhere in the country of a work carried on so carefully and under such control as the work which has been done by the committee in this city.

I believe that the statement which I made as I began my talk is true. I really believe there is not one thing which can be done which would so raise the standard of national health as attention to mouth hygiene, especially in regard to the teeth. I think not even the most enthusiastic dentists, like Dr. Hyatt, for instance, have any idea of it. If the proper attention could be given to the mouths of the children in the public schools the general health of those children would be greatly improved.

Seven years ago, in Manhattan, there was opened in the school at 552 West 53d St. the first dental clinic in the United States. This was carried on through this society, dentists giving their services free, the society paying for the materials used and equipment. Dental treatment was made compulsory upon every child in the school.

Clinics have been started in the Five Points Industrial School, in Chambers Street School, in the Colored School in 53d St., and in the Sullivan Street School among the Italians. If the principals were here to tell you of the improvement in better attendance, work and deportment of these children, you would hardly be able to credit it. The results have not been carried on scientifically, but solely in the interest of the children—children who are in most cases unable to go to the public schools because of the poverty of their homes. The results have been startling.

I think no one, least of all the dentist, is willing to believe that all the ills flesh is heir to come from the teeth. I do think in the light of the work recently done in bacteriology by Rosenow, and those associated with him, we cannot lay too much emphasis upon the care of the human mouth and the relation that the mouth bears to the general health and well being.

Not the least has been the educational value to the children. Into all these homes there has been brought for the first time a realization of what dentistry may mean.

I well remember the small child who came to my office a year ago, evidently looking for a monster behind the door, and with her teeth in a terrible condition. I wondered whether I should ever be able to do anything in that mouth, and yet that child has never failed to keep an appointment, rain or shine. I do not know whether it rained in Brooklyn last Saturday or not, but it did in New York, in torrents, and that child kept her appointment in spite of rain, and was one of the children here

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to-night, and the mother came with her on each of the visits, and there has been no greater appreciation than that of that mother and that little child.

As to the report you have listened to, I have nothing to say more than that I believe it will mark an epoch in the work which is being done by the dental profession in the United States in the interest of mouth hygiene.

President Lewis. I said this evening that one of our members was one of the pioneers in the mouth hygiene campaign, and has been talking on the subject for a number of years, and is still talking. As he is still talking, we are going to ask him to continue the discussion of this paper. Dr. Thaddeus P. Hyatt.

Dr. Hyatt. The only thing I should like to say to-night is to ask, what will be the next step? I do not think I need to say anything in regard to what has been done. I think the report has been most favorable in that it has been so conservative. I believe with Dr. Stevenson, that if the committee had reported to us this evening wonderful improvement, children from twenty per cent. in study jumping to one hundred per cent.—that children had not stayed away at all, that blindness had been cured and cripples walked, we might have had a great deal of doubt about it.

The report that has been made to-night is one that we should feel greatly encouraged by. We have all known that it is very hard to control children as they are in the schools to-day, but that is not to my mind the most agreeable and the most important part for us as members of the dental profession to look at. To me the most important part is the fact that we have with us three persons who are not members of the dental profession, two physicians and an educator. You have heard what they said. We had one rebuke, that we ought to have done it before.

My friends, you have no idea how hard it has been to start it now. It has not only been the bashfulness—I cannot say of the members of the dental profession—but timidity in taking up work that we questioned being able to prove the value of. There has been a timidity by a great many of the members of the society. I think that ought to be removed to-night, and to me the one interesting question left now is what are we to do next?

I believe men are realizing the importance of reflex nerve action—how the irritation caused by the nerve in a decayed tooth is reflected back, and comes out in some other part of the body—how it affects the mentality, and the other senses, coupled with malnutrition. That is bound to come logically as well as scientifically, because the mouth is the portal of all the food and liquid and air that the child takes in.

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I think if we can to-night appoint a committee, and have these three gentlemen on the platform, who are not dentists and not members of our society on that committee with us, and then try to interest every man who has any friends that are in touch with or can introduce him to the officials of this municipality, I believe we can go to the Mayor, and to the Board of Estimate, and show them where the city will save money by spending a certain amount in taking care of the children's mouths. I hope that some action along that line will be the outcome and this meeting will, to a great extent, have failed if it does not become the birthday of a new movement.

We have proved conclusively to these two physicians and to Dr. Walsh the improvement that has come to the children; and if we can gain their co-operation and that of any other of the educators in our public schools, and then go to the Mayor, I believe that this meeting will have been a great success. I sincerely hope that that timidity has disappeared from among our members, and that the friends will all cooperate with us, and that such a thing can be started at once.

Dr. Lewis. Ladies and Gentlemen, this subject is now open for general discussion, and we would be pleased to hear from any person who may wish to address us.

Dr. Hyatt. Mr. President, I should like to add that the member who first suggested this idea, and who has done so much for it, is present, and I think he should be invited to speak.

Dr. Lewis. Dr. Ottolengui, we would like to hear from you on the subject.

Dr. Ottolengui. I feel particularly honored to think that a suggestion that I made before this society has been carried out, especially as "carried out" in this case means that so much work has been done by so many men; but would it not be time wasted and a sin, if we did not make a logical deduction from this work, which I think has not been made?

Dr. Hyatt truly asks: "What next?" He said he was encouraged by the report. I think he ought to have been awfully discouraged by it. There is a point that I want the gentlemen on the platform to note particularly. This test, if it has proven anything, has proven the absolute impossibility of curing or stemming the tide of caries in the public schools by the filling of teeth. We had a chance to take care of over three hundred children, yet only one hundred and sixty children accepted our care, and with a year's work by sixty-three men we succeeded in completing the filling of the teeth of only eighty-two children; and there are

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six hundred and eighty-five thousand children in the public schools in New York, all in the same condition.

Prevention Better than Cure.

It proves that this disease must be prevented, and not cured after it occurs; and the way to eradicate it is not to take hold of the entire school system of the country, when we have not dentists enough to fill the already decayed teeth that exist in the mouths of these children. We should take the child that comes into the school at the beginning of his career, and safeguard him from that time through, so that at least the possibility of caries in his mouth shall be minimized. I must say that I have been very much discouraged to hear to-night from Dr. Crampton that in the very lowest classes thirty per cent. of the sixth year molars are already diseased. That makes the work before the prophylactician much greater than I had thought. I had harbored the hope that with skilled prophylactic work in the schools, starting in the lowest grades, caries might be very much minimized.

I want to say just a few words about this test. We went into this matter honestly. I think a good many of us felt that with the test that had been made in Cleveland, where the children were under absolute control, and where a great many things besides dentistry were done, including special food and training, so many claims were made that the educators and the physicians of the country were not very much impressed.

The effort here was to see what just average dentistry would do for children—to see what would occur if the children just went to the nearest dentist. And we have found that *very few would go even if they could go free.*

I do not see any of the children that I treated up on the front row. I want to show you that although this test was suggested with the idea of proving to the Board of Health and Board of Education that children would do better with sound teeth than with unsound teeth, and notwithstanding the fact that accidentally I got three children instead of two to take care of last winter, my very first examination of these children satisfied me that there was little possibility of my increasing their mental, moral or physical records so that they would show a high percentage of improvement.

In the first place of these three children, two had malocclusion. No amount of filling of the teeth of those children would give them efficient masticatory apparatus. One had a very pronounced Class III condition. Gentlemen, filling that boy's four molars could not give him a good masticatory apparatus. There was no chance for me to make any show-

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ing on his school records. He also had a very low mentality; he had a mental endowment that I do not believe could be stimulated simply by filling four holes in four teeth, but I do believe that he was improved in another way that I will mention in a moment.

Now in the second child sent to me, a girl, I found it necessary to fill two small cavities in upper molars, and remove the pulps in two lower molars. I have no doubt I made her more comfortable, but that was all I could do. She was as bright as a button; on the minute for every appointment. She was an Italian, and knew she was getting her money's worth.

The other little girl I had was a very nice little lady, and she had the hardest time of all. She only had the treatment necessary to four molars I had to fill two upper molars, and remove the pulp from two lower molars.

Of these two girls, one very bright, one just medium, and the boy dull, only twelve fillings were put in; and beyond making these children comfortable, that particular work could not have had very much effect upon their school standing or records, except as it stopped toothache for one girl, and I see by the records that that girl made the best school improvement.

None of these children were cleanly in mouth habit, and it seemed to me that my associate, Dr. Kinney, could do a great deal more than I for these children by giving them regular drills in prophylactic work These children were regularly drilled in the methods of cleansing their teeth, and I do think we succeeded in making one of them learn how to clean the teeth thoroughly and to keep them clean; but curiously enough, the brightest girl was not the one that learned to keep her teeth the cleanest. Yet it was the girl who did learn who showed the best improvement. Therefore it seems to me that it was not so much in the curative work, but in the prophylactic work done in my office by Dr. Kinney, that the highest good was accomplished.

The real interest in these figures lies in the fact that any improvement could have been made in these children practically, not since their teeth were finished, but during the progress of the work because these records were made whilst this work was going on. It has been said here to-night if the record for the next term can be taken after all of the work was done, and especially if those mouths could be kept clean, we would have even a better showing. What does that mean? That means they must not be allowed to decay at all. It means the sum total of a tremendous amount of manhood and womanhood saved to this city, if we preserve the health of the children, and the last suggestion I would

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make is, as we have before us the men who are powers in the municipality in health and educational matters, can we not have the co-operation of the Board of Education and the Board of Health, and of this society in one more test?

I would like to see children selected in whose mouths there is a tremendous amount of dental work needed; not two or three cavities for each. I would like them chosen where they have absolute septic conditions. I would like them to have teeth not in malocclusion, but sent to us solely on account of the dental work needed. If coupled with that, these children have a health record which shows that they are suffering with that kind of disturbance which we, as dentists, claim arises from this condition in the mouth; and if along with that they are low in their grades and studies, and if these specific medical records and these specific school records be taken, and then these particular children be put into our hands, I believe that I can guarantee that we will improve every one of these children in health and education at least fifty per cent.

Dr. Shea. Dr. Ottolengui stated that it did not make very much difference about two or three cavities. Two or three cavities can contain bacteria. If they have done nothing else then, they have changed these children's mouth conditions.

Of course, there are many that have malocclusion, and malocclusion takes a great deal of time to treat. I do not say he could give them back their proper occluding surface, but he could give them back a clean, healthy mouth, so that the food that passes through there would not go into their systems in a tainted condition, and then, at least, we could help the health of that child.

The constant pouring of pus into the system, as Dr. Hartzell and many other men state, reduces the immunity of that child, and I say, if we cannot do anything else, we can teach those children to keep those teeth clean.

Dr. Hyatt. Before we adjourn, I should like to move a vote of thanks to that Committee. I know they had a great deal to contend with, and I think that Committee ought to receive a very sincere vote of thanks from this society, and I would also like to include a vote of thanks to the members of the Board of Health and Board of Education that have so ably co-operated with them. (Unanimously carried.)

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Influence of Dental Attention upon the Mental and Physical Condition of Children.

The dental profession having been aroused to the dental needs of children, especially of children in the public schools whose parents may not be financially able to supply their progeny with such care, the dentists of this country have energetically set about finding a solution of this huge problem.

In order first of all to prove the need, dentists began making inspections of the teeth of children in the public schools. Such inspections at first were resented as being useless, besides interfering with school routine. A few persistent dentists, however, soon unearthed such dreadful conditions that very soon the right to inspect was granted whenever request was made. The reports from all parts of the country have been so similar that it is safe to assert that caries is a disease very prevalent in young mouths, and that a very conservative estimate states that seventy-five per cent. of all school children are thus afflicted.

The First Remedy Suggested

Seeking for an alleviation of this scourge, it is not strange that the first remedy thought of should have been the Free Dental Clinic. "If children are suffering, shall we not treat them?" The answer seemed obvious, and free dental clinics began to appear. But though the dental world easily recognized the need, municipal officers were not so easily convinced. Hence the earlier clinics were equipped with money

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furnished by dentists and the services were rendered by dentists free of charge. But very shortly it became apparent that not all the dentists in any town could fill all the teeth of school children needing attention. Consequently, dentists tired of giving so much of their time for such meager results. Hence, it became necessary to prove to School Boards, Boards of Health and City Fathers that the children's needs were great enough to warrant the expenditure of the city's money.

The Marion School Test.

Then Dr. Ebersole, aided by other Cleveland dentists, undertook to prove practically the advantages of mouth hygiene and dental care. The so-called Marion School test was carried through and marvelous results reported. Indeed, these results as reported were so marvelous that the incredulous refused to believe. Yet there is no doubt that all the records were correctly tabulated and reported and that the children were benefited to the extent claimed. Nevertheless, this test was lacking in one great essential. It was impractical to apply it to our public school system. Such care as was given to these thirty children could not possibly be given to the seven hundred thousand children in the New York Schools, for example.

The Second District Society's Experiment.

The Second District Dental School of the State of New York undertook to investigate this matter by another route, and the results of that experiment are published in this issue and should be read by all apostles of mouth hygiene, by all Health Boards and School Boards, and by all lovers of children.

The avowed aim was, if possible, to determine what advantages would accrue to retarded children by supplying dental service. Not special service; not special diet and lessons on mastication; not dentistry admixed with physical culture and what not; but just plain, everyday dental service, such as a child might get from the dentist nearest to his home.

The report, as has already been said, is most important, and should be carefully studied in detail, if one would arrive at the true meaning. But a few very significant facts may be selected upon which to found a discussion.

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Conditions of the Test, and Results.

First of all, the children were not to be grouped together and specially taught, exercised, fed and treated. Thus there was no element of personal pride aroused, and no co-operation of one child with others, through example or ambition, to excel its classmates. Nor did the dentists meet together, arranging methods of treatment and combining their efforts to the desired end. Each dentist agreed to receive into his private practice two school children and to care for these two as required for the term of one year.

It was clearly explained to the parents of the children that the dentists selected to do this work were competent men, and that there would be absolutely no charge made. These letters were sent to the parents of 327 children retarded in their studies and in need of dental care. Consents were received from 243, so that twenty-five per cent. of parents to whom this service was offered declined it, or at least did not accept. Whatever the reason, this alone would indicate that the mere offer of free dental service will not solve this great problem. But we are yet to see that not even the other seventy-five per cent. accepted.

In the first assignment of children, 164 children were assigned to eighty dentists, and at once trouble began. To quote the report, "The children failed to keep appointments. We had reckoned without the child. Some of these refused to appear for treatment because the dentist was too far. Others for the same reason that a great many perfectly normal and intelligent people give."

Of the original quota of 327 children greatly in need of attention, eighty-two were actually treated thoroughly, a still greater evidence of the futility of offering free dental service, except as a charity.

Results Obtained by Treatment.

The results obtained with the eighty-two children treated are so entirely credible and yet so important in showing that simple, plain dentistry, honestly administered, is of real advantage to the child, that there can be no escaping the duty which now devolves upon the communities, for the child is the greatest asset in community life. That duty is this: *The child's teeth and mouth must be cared for, even though a clinic in every school be required, coupled with compulsory prophylaxis and dental attention.*

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Of the eighty-two children actually treated, fifty-five per cent. improved in their studies, the average improvment per child being over ten per cent, and this average was actually higher because twenty-seven of the children retrograded, and the care of their teeth and mouths certainly could not have been connected with such retrogression, yet these delinquents were included in computing the average advancement per child. But while we may expect some improvement in aptitude at study through dental care, this would be but a collateral result. What dentists loudly declare is, that care of the teeth will improve the general health. It is gratifying, therefore, to find it stated in the report that of forty-two cases of malnutrition, twenty-two improved and seventeen were cured, a total of ninety-five per cent. cured or improved. Two cases of defective hearing are both reported as improved after dental care. To fully appreciate these statistics it must be remembered that the dentists knew nothing of the records of these children. The school records before and after treatment were taken by the School Board and the health records by members of the Board of Health.

It seems therefore fair to presume from this test and its results that plain, everyday dentistry, combined with prophylaxis, will improve the child's health record and study record. It also seems to indicate that the free dental clinic, as valuable as it is, will not greatly stem the tide of dental caries in the public school.

The Prophylaxis Clinic.

Just at this psychological moment in the history of this mouth hygiene campaign, comes the graduation from the Fones School for Dental Hygienists of a class of thirty young women who will take up this work seriously. Of this number Dr. Fones has reserved a staff who will co-operate with him in establishing a purely prophylaxis clinic in one of the public schools of Bridgeport, that city, with commendable enterprise, having voted the money with which to carry on the experiment, an experiment which should arouse the keenest interest throughout the civilized world as the first scientific attempt to prevent caries in a wholesale effort.

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IT WAS RECORDED in our last issue that at Rochester I made a promise to describe the use of sodium and potassium in the treatment of root canals. I cannot do better perhaps than to report a conversation that occurred in the Dutch Grill of the Hotel Powers. A gentleman from Cleveland remarked: "I listened with much interest this morning to Rhein's lantern talk on root canal treatment and filling. It was enlightening to see radiographs of roots improperly filled by the previous dentist, and other radiographs of these same teeth cleaned out so that wires in the canals were shown in the radiographs to be at or through the apex. I am willing to admit that he has done this, because otherwise he could not have the radiographs, but I do wish he had more fully explained the technique. It does not enlighten me much to hear him state that with sodium and potassium he succeeded in reaching the end."

"I AM GLAD YOU brought that up," said a man from Minneapolis. "I bought a bottle of that stuff once, and used it in a root canal without any benefit whatever, and I sealed it in three times at that. But at the fourth sitting I could get no farther up the canal than at the first sitting. And what was worse, by that time the whole bottle of the stuff was useless; turned to a dry powder."

"SODIUM AND POTASIUM is not to be used in that manner," said I. "If you wish I will describe the technique." Having obtained unanimous consent, I continued. "Sodium and potassium was introduced to the profession of this country at the World's Columbian Dental Congress and in value is worth all the money spent on the congress. It was presented by Dr. Emil Schreier, of Vienna, and the best preparation is that put up under his supervision, and imported. Another preparation put up in this country is in small phials the object of which was to meet the complaint that the agent rapidly disintegrates by oxidation. Hence the smaller the package the less the loss. As a matter of fact the reverse is true, as it is almost impossible to preserve the contents of the

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small phials once they are opened, so that the final expense is greater than with Shreier's package. This is shaped like a short test tube, the sodium and potassium appearing like an amalgam, covered at the top by about a quarter of an inch of paraffin. In order to reach it, an instrument is used to puncture a hole in the paraffin, thus gaining access to the sodium and potassium compound, but immediately after the treatment of a tooth the hole in the paraffin should be closed by pressing into it a warm burnisher. This prevents the oxygen of the air from reaching it. and as it has a tremendous affinity for oxygen, if this precaution is not taken it will rapidly disintegrate by oxidation."

"SODIUM AND POTASSIUM is not primarily intended for use in canals in which living pulps are present. Nevertheless, in cases where pressure anesthesia has not been entirely satisfactory, or where the removal of the pulp has not been certainly accomplished, the compound may be used to good purpose. It is, of course, most undesirable to leave a terminal filament of the pulp at the apex, since by the following day when all effects of the anesthetic will have passed off, this filament will be found very much alive and exceedingly difficult to anesthetize. Where doubt exists therefore, it has been my practice after controlling the hemorrhage, and before the anesthetic effects have disappeared to use the sodium and potassium compound for extirpating the remains of the pulp, just as one would proceed in the presence of dead tissue.

"THE METHOD of using sodium and potassium is as follows: Select the finest of the Young Aseptic broaches, and having made a hole through the paraffin, push the broach down into the compound. It will come forth evenly charged with the amalgam-like mass, and must be used immediately, as the compound oxidizes rapidly when exposed to the air. Therefore the rubber dam should be in place, the cavity cleared of all débris and ready access to the opening of the canals must have been procured by freely cutting away the occlusal surface. Let us suppose that the opening to a canal has been found but that a fine clean broach has failed to penetrate more than a quarter of the length of the canal. We desire, with the aid of the compound, to clear out this canal to the apex. The fine broach freshly charged with the compound, is forced into the canal as far as it will go, using an up and down stroke. A rotary movement may also be exerted, but only with the greatest caution. Have the following axiom constantly in mind when working in root canals. *A broach will never break if moved only forward and back in a canal, but may and often does break when rotated.* The reason is simple. If the end jams it can best be dislodged by a straight backward withdrawal. It can often be broken by rotating it. Therefore avoid rotation of a broach as much as possible.

"THERE IS ONE other thing needed besides the sodium and potassium in reaching the end of a canal. This fine broach naturally carries but a very small dose of the compound to the part of the canal which is filled with partly calcified material. Therefore time is required. The story will be like this. Charge the broach with the compound and pump the

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instrument gently back and forward a few times. No progress! Cleanse the broach, and recharge it. No progress! Repeat the process. No progress! Repeat the process. No progress! Repeat the process. No progress! Here some impatient men abandon the treatment, and wander around dental meetings declaring: 'There is nothing in that sodium and potassium treatment. I have tried it.' Other men proceed as follows: Recharge the broach, pump back and forth. "Ah! That went a little deeper!" Repeat. "Ah! A little deeper still!" After which the progress is usually satisfactorily rapid. In many cases the calcification of the pulp has built a bridge across the canal which prevents ingress, and it takes some time to break down this mass chemically by the action of the sodium and potassium, but having passed this point the balance of the canal may be fairly easy. And it is exactly this class of unfilled root that gives trouble because the dentist by stopping at the bridge, as it were, leaves imprisoned in the canal beyond, a considerable mass of material which is most attractive pabulum for bacterial organisms.

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"SOMETIMES, however, the entire canal is filled up with calcific material and there is no such satisfactory result as to find the broach suddenly passing the bridge and plunging forward into comparatively clear space. It is these cases of almost complete calcification that test a man's patience as well as his ability to convince his patient that the service will be worth the time and money expended upon it. Yet both may be done.

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"BUT IT IS NOT alone in the presence of calcific material that sodium and potassium is valuable. It is a magnificent agent for sterilizing infected canals, and even may be relied upon to sterilize the tubuli. Its power as a germicidal agent was well proven in a series of tests carried on a few years ago, with the assistance of a competent bacteriologist. The operator was supplied with sterilized glass tubes, into which broaches to be tested were placed by first breaking off one end of a tube and then after introducing the broach resealing the tube by melting the end in an alcohol flame. Some of these broaches were bare broaches used for exploring infected canals. Others were broaches which had been charged with sodium and potassium and then used for sterilizing the canals. Some of these latter were even dipped directly into pus. In all cases cultures were procurable from the dry broaches used, but in no single instance could a culture be obtained from any of the broaches which had been charged with the sodium and potassium."

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"HAVE YOU ever had any pain or trouble," asked an Atlanta man, "from having the compound pass through the end of the root? I have had considerable pain from having a tiny particle drop on the back of my hand, and I do not think I would care to have it go beyond the apex."

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"ONE SHOULD certainly be cautious in young teeth, or any teeth having large foramina. Yet after twenty years' experience with the compound I do not recall a single case of irritation or trouble of any sort. It must be remembered that it is to be used only on the finest of broaches, and

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❖ that it oxidizes so rapidly that it is frequently difficult to get a good
❖ dose of it far up into a canal. Usually, therefore, one need have no
❖ anxiety on that score."

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"DOES THIS COMPOUND sufficiently cleanse out a canal," asked a friend
❖ from Columbus, "so that one may immediately fill it?"

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"THAT IS A TIMELY question. It does not cleanse the canal at all, Where
❖ calcific material is present it breaks down their solidity so that the
❖ particles may be picked out. And where only soft tissue is present by
❖ chemical combination it forms a mass almost resembling green soap.
❖ After treating a canal which may have appeared clean prior to treat-
❖ ment, it will be a revelation to many to see the débris that may be re-
❖ moved. This after treatment includes syringing with peroxide of hydro-
❖ gen into which is mixed mercury bi-chloride (1 to 500), after which I
❖ prefer to go further and cleanse the canal with whisps of cotton wound
❖ on the finest of the Young broaches and dipped in the same peroxide
❖ solution. When these bits of cotton are withdrawn they should be re-
❖ moved from the broach onto a napkin, when they will appear as a
❖ green stripe. A new whisp is introduced and the process continued so
❖ long as these bits of cotton show any color, after which the syringe
❖ should be again used, followed by clean sterile cones of bibulous paper
❖ for removing the moisture."

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"I AM GOING to try it," said the Cleveland man. "Ditto likewise," remarked
❖ the others present. "I wanted to ask someone to tell me the best
❖ method of applying arsenic," said the Atlanta man. "There is no best
❖ way," said the Minneapolis dentist, "all methods are bad." "Oh! I
❖ don't know about that," said our friend from Cincinnati. "But it is too
❖ late to tell you about it to-night. To-morrow night, perhaps."

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Infection of the Pulp.

The author then considers the infections, with special reference to ulcerations and abscesses of the pulp. He has found that abscesses are far more common in the multi-rooted teeth than in those having a single root.

Of the chronic diseases, hypertrophy is first described and cases are cited in which the hypertrophy was accompanied by absorption of the dentin. Under degenerations the deposition of calco-globulin in diseased conditions and the formations of pulp stones is reviewed. The hard formations within the chamber are described as follows:

(1) Secondary dentin.
(2) Dentinal tumors in the pulp chamber.
(3) Nodular calcifications among, but not of, the tissue of the pulp.
(4) Interstitial calcifications of the tissues of the pulp.
(5) Cylindrical calcifications of the pulp.
(6) Osteo-dentin.

The author makes the statement that very frequently slight chronic affections of the pulp will cause the destruction of a portion of the layer of odontoblasts. In case a secondary deposit of dentin is formed in this region, it is devoid of tubuli or dentinal fibrillæ. Also, that under certain conditions these odontoblasts which have been lost may be regenerated.

In his conclusions Dr. Black says that all secondary calcific formations within the pulp result in exhaustion and final death of that organ. In view of this fact he decries the practice of stimulating secondary dentin and urges the use of non-conductive materials beneath all fillings which are in proximity to the pulp.

Eugene S. Talbot.

Eugene S. Talbot has reviewed the work which he has done upon the pathology of the pulp, in his book entitled "Developmental Pathology." Chap. xxviii of this work treats of the dental pulp and opens with a general statement as to its evolution and development. The author then considers the possibility of the existence of a lymphatic system in the pulp. He states that he has been unable to demonstrate the presence of lymphatics but describes oval spaces, without walls, in the pulp tissue, the nature of which is not clear. Whether there be lymphatics or not, the author is very certain that the pulp has a good regenerative process by which diseased and abscessed areas are repaired and restored to health.

Pathology of the Pulp.

After describing the vascular and nervous system of the pulp, Dr. Talbot takes up the consideration of its pathology. He states that the causes of pulp disease are changes in the blood stream which

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are due to poisons circulating in the blood. These poisons are, in the opinion of the author, the result of degenerative conditions, and may produce in the pulp a faulty metabolism and auto-intoxication which make it susceptible to any of the pulp diseases. Such a pathological degeneration begins as soon as the apex of the root of the tooth is closed.

Because of its structure and physiology the pulp is very susceptible to inflammatory changes. According to the author, in case of obstruction, the intravascular pressure alone is sufficient to produce rupture of the capillaries and marked diapedesis. The absence of lymphatics and collateral circulation causes the pulp to pass quickly from hyperæmic states, through inflammation to death by coagulation, stagnation, neurosis or thrombosis.

In the consideration of pulp abscesses it is stated that they may occur at any location. A number of excellent micro-photographs are shown in which abscesses may be seen in their various stages, from that of areas of small cell infiltration to large abscesses and complete dissolution of tissue. The sections show degenerating odontoblasts and nerve fibres of thickened arteries. One particularly fortunate section, "Fig. 330, shows A, a circumscribed area of acute inflammation about to liquefy and form an abscess; C, a fully formed abscess, and B, the cicatrical tissue of an old abscess, showing conclusively that restoration of a diseased pulp is possible." These illustrations are followed by several showing nerve end degeneration with cases of specific Wallerian degeneration.

The author then takes up the discussion of the various pulp diseases and illustrates many with sections. He speaks of the pulp as being an end organ, without collateral circulation or lymphatics and having but a single exit for its venous circulations, all of which renders it susceptible to thrombosis. The thrombi are described as being due to the embolism of the products of degeneration, fat droplets, tissue fragments, tumor cells, air, etc.

Inflammation of the arterial coats is spoken of as being very common. He calls the pulp "a unique end organ whose arteries are susceptiable to obliterans and arterio-schlerosi, which predispose to degeneration and necrosis." The causes of this condition are stated as being auto-intoxication, and drugs taken systemically which may become irritants, syphilis, gout, rheumatism, Bright's disease, alcoholism and metal poisons.

As a result of arterio-schlerosis in the pulp, cloudy swelling and fatty degenerations occur, which conditions are often associated with typhoid fever, septicæmia and other acute infections and toxic diseases. Amyloid and hyaline degeneration is described as well as the various calcific concretions which so readily form in degenerating pulp tissues.

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Though the exposed surface of the seam of cement may be considered a disadvantage of the inlay, in the deeper parts the presence of the cement undoubtedly is of advantage. It intimately unites the inlay with the tooth, thereby hermetically sealing the cavity and obviating the danger of leakage. No other filling, oxyphosphate of zinc cement excepted, is so free from leakage as the porcelain or the gold inlay. Gutta-percha makes a notoriously leaky filling. Amalgam fillings, owing to the spheroidal tendency of this material, or due to improper manipulation, are occasionally found to be leaky. Even among large fillings made of gold-foil, a considerable number may be found that do not perfectly seal the cavity.

Hygienic Conditions of the Mouth.

Unhygienic conditions of the mouth are due either to personal uncleanliness, or to the presence of places in which food particles are retained. Such conditions, being a predisposing cause of caries, will endanger any filling. While on the other hand, fillings cannot affect personal cleanliness, they can improve the hygienic conditions of the mouth by restoring the teeth to their normal form, thereby depriving the food-particles of their place of lodgment.

The office of a filling is to restore the form and the physiological function of the tooth. The restoration of form can be considered perfect only if the surface of the filling is absolutely smooth; the margins accurately adapted, and finished flush with the surface of the tooth; and the filling so contoured and provided with a contact point, that in connection with the adjoining tooth a self-cleansing space is formed.

The result of my observations is that in regard to smoothness of the surface, the inlays are the most perfect. The reason probably is that inlays can be so easily polished before being set into the cavity. Gold and amalgam fillings, owing to the fact that access to the approximal surfaces is often difficult, are not always as carefully polished as they should be. The surface of a gold filling may also become rough through exfoliation, if the foil has been insufficiently condensed.

Perfect marginal adaptation is most easily obtained with the plastic fillings, though in the case of amalgam this adaptation may not always be permanent. Gold or porcelain inlays and foil fillings require about an equal amount of skill. In inlays, however, marginal adaptation can be controlled before setting the inlay. With foil fillings this is possible only after the filling has been completed.

Whenever the margins of a filling are readily accessible, they can be easily finished flush with the surface of the tooth. The cervical margin, however, presents difficulties; so that numerous amalgam and, occasion-

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ally, foil fillings are found that are imperfectly finished at this point. There is no excuse for inlays presenting margins elevated above the surface of the tooth; as at those places where the margin is not easily accessible, the inlay can, with reasonable care, be disked outside of the mouth.

Contours of gold foil and of amalgam are built up in the rough, by the aid of matrices. The finer lines of the tooth are reproduced in finishing the filling. In order to allow for the thickness of the matrix, and also for convenience in polishing, it is often necessary to use the separator. Fewer difficulties are encountered in contouring the inlay. The wax pattern for a gold inlay is more easily modelled in the mouth than a filling made of harder material. Porcelain, also, can be contoured more readily, as the work is done outside of the mouth. Owing to the fact that no matrix is used, and that the inlay is finished outside of the mouth, the separator is required only in very exceptional cases. Where the space formed by the moving away of the adjoining tooth is to be closed, the gold inlay, if suitably anchored, is the strongest and most easily contoured filling.

The contact point of a gold foil, or an amalgam filling carefully reproduced while finishing, is subsequently endangered in polishing. If accidentally destroyed, this point cannot be replaced without partially remaking the filling. Upon the gold inlay the contact point can be placed exactly where it is needed. After the wax pattern has been contoured, the exact position of the contact point is marked. If the sprue wire is attached to the pattern at this point, the sprue on the cast inlay can be so formed as to give an ideal contact point. This method has been used by the author since the introduction of casting. The consequences of destroying the contact point of a gold inlay while polishing are not serious, as it is always possible to repair the damage with a drop of solder.

The physiological function of the tooth can only be restored by reproducing the cusps and fissures upon the occlusal surface of the filling. As it is almost impossible to accomplish this with gold foil, large fillings of this kind usually present flat occlusal surfaces, with but very slight evidence of cusps. Well-modelled occlusal surfaces of amalgam fillings are more often met with, as this material is more easily carved. The most perfect occlusal surfaces, however, can be produced with the gold inlay. The cusps of the antagonist impress themselves in the wax pattern; but little skill in carving is therefore required to produce a filling whose cusps articulate exactly with those of the antagonist. As perfect mastication depends largely upon proper articulation, I consider the gold inlay to be the ideal filling for the restoration of the occlusal surfaces of the teeth.

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Histological Structure of Dental Tissues.

Faulty structure of the dental tissues has no direct effect upon the filling. It is, however, to my mind, the most important predisposing cause of caries. On the other hand, the effect of various filling materials upon the dental tissues is so marked that it is surprising that more investigations along this line have not been made. A comparison of the effects of various filling materials upon the dentine was published years ago in "The Anatomy and Pathology of the Teeth," by C. F. W. Bödecker of New York. According to the researches of this author the following effects were observed:

(1) *Gutta-percha.* This never showed the slightest reaction at the border of the cavity in the dentine. The dentinal canaliculi and their tenants terminate abruptly toward the cavity.

(2) *Gold.* In some instances no reaction was noticeable in the dentine—in others there is a distinct reaction along the border—but it never is as marked as under oxyphosphate of zinc.

(3) *Oxyphosphate of Zinc.* The reaction is almost constantly present, and consists of a solidification of the dentine and an obliteration of a number of dentinal canaliculi. The consolidation is densest along the border of the cavity, where dentinal canaliculi are quite scanty; but the consolidated dentine extends to a considerable depth before it blends with normal dentine.

(4) *Amalgam.* The features that appear after the introduction depend upon the length of time the material is left in the cavity. A few months after its introduction a pronounced discoloration of the border of the cavity is almost invariably visible. This is due to the penetration of silver or mercuric sulphide into the dentinal canaliculi. Tin fillings behave similarly to amalgam, only in a less pronounced degree. After the lapse of several years the reaction of amalgam upon the adjacent dentine is quite marked.

Nothing is known about the reaction of the enamel under filling materials. However, owing to more recent investigations, the fact is becoming more generally recognized that this tissue does possess a certain amount of vitality. There is, therefore, most probably in the enamel, a reaction similar to that in the dentine; but owing to its much lower vitality, the reaction will be proportionally less marked. The cementum, also, when the cavity involves this tissue, shows signs of a reaction.

Under the inlay the reaction of the dentine is, if anything, more marked than under oxyphosphate of zinc cement. The greater amount of phosphoric acid in the thinly mixed cement probably acts as a more intense stimulant. The fact that cement hermetically seals the cavity,

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thereby overcoming the danger of a leaky filling, and that it also changes normal dentine, easily destroyed by caries, into a tissue which has the appearance and the resistance of so-called senile dentine, is probably the reason why secondary caries hardly ever appears at the margin of a cavity filled with an inlay.

The reaction of the pulp, due to sudden thermal changes, is least marked under the porcelain inlay. The conductivity of a metallic inlay, owing to the insulating layer of cement, is much less than that of a gold or amalgam filling of the same size.

Further comparisons of inlays with fillings might be made, for example, upon the basis of æsthetic effect, or of time required to introduce the filling, or of relative value of different fillings in comparison to their cost. This question has, however, been so frequently discussed from these standpoints that comparisons along these lines need not be included in the report.

If asked which filling I consider to be the best, I would certainly answer: "The filling which, as the result of examining a very large number of patients from all classes of practice, is found to be perfect in the greatest percentage of cases. This, though being true, is hardly a practical answer. In fact, I do not believe it is possible to answer this question, except from the standpoint of the individual operator. The old maxim, "practice makes perfect," is applicable to the point in question. The operator, who, on account of the class of his patients, is forced to make a large number of amalgam fillings, will become proficient in the manipulation of this material, and will make the best fillings of this kind. His percentage of failures will be low—much lower than that of the operator who uses gold almost exclusively. The latter, as a rule, considers amalgam to be a second-class material, and ascribes his failures to the defects of this material rather than to his own lack of skill. The inlay being the newest filling, has suffered most in this respect. The contention, that it is easier to make a gold inlay than a foil filling, is based upon the misconception of the skill and patience necessary in making a perfect inlay.

In conclusion, I wish to state, briefly, under what conditions I, personally, favor the use of various fillings. In healthy adults with well calcified teeth, I use foil fillings in the small cavities upon the occlusal surfaces. In the teeth of young or constitutionally weak patients, I use the gold inlay upon the occlusal and approximal surfaces when a metallic filling is indicated. Rather than use amalgam in such cases, I have made inlays of pure silver. Not but that I have seen large amalgam fillings of which I should be proud of if I had made them, but success has

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not always attended my efforts with this material. Porcelain I use in all visible cavities in the anterior teeth, except where these teeth have been extensively abraded by a strong bite. In such cases I prefer to use 22 kt. gold inlays. In very small cavities in the anterior teeth, instead of porcelain, I use silicate cement. The other cements, copper and zinc, need not be considered in this report.

If in comparing inlays with fillings my report seems biased in favor of the inlay, let my excuse be, that through long experience with this method of filling teeth, I have learned to value it, and that everything I have said in its favor is my firm conviction. With amalgam and foil fillings my success has not been so great as with gold inlays; in my case, therefore, the inlay is my best filling. Others may find the technique of foil filling, or of porcelain work more to their liking, and, consequently, will produce a greater number of perfect fillings by one or the other of these methods. Therefore, as we strive to give the greatest benefit to the greatest number, let each one, by choosing the method that is his best, do the best for his patients.

Report on the Practice of Pressure Casting Compiled from the Recent American Literature.

By Clarence J. Grieves, M.D., of Baltimore, Md.

Section V. Sixth International Dental Congress, London, August, 1914.

"All true science begins with empiricism, although all science is science for the reason that it strives to pass out of the empirical stage."—Huxley.

The word "Practical" is defined as "relating or pertaining to action, practice, or use; derived from experience; capable of being used or turned to account; contributing to one's material advantage; possessing utility; opposed to Theoretical, speculative or ideal."—*Century Dictionary.*

Practical Knowledge is said to be the "knowledge the end of which is action."

So the practical side of the casting question is the knowledge gained from experience which ends in action; the production of, not words nor theories, but a casting which contributes to our material advantage and which can be applied with accuracy. In a broad sense, there can be nothing practical which is not intensely scentific, and successful practice is science applied to our work; but many methods are producing comfortable results, the reasons for which we do not know; in fact, the major portion of our practical actions is empirical; the reason or science for such action will have to be discovered later or remain undiscovered.

The scientific side of pressure casting is involved in another report, and where the science is known these reports interchange. Dividing this subject broadly into the operative and prosthetic fields, we must again

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subdivide it into the direct and the indirect methods; the direct, which was practically the original method of dentistry, and the indirect, which consists in the interposition of an impression and cast of the field to be copied with many variations; after the wax pattern is obtained it is the same as the direct.

Of these methods, the concensus of opinion obtained from a study of the literature on the subject is decidedly with the direct method, which is that of Taggart, and will be described in his own words.

Taggart's Methods.

Whatever the discussion, still continued, as to methods of casting as applied to dentistry prior to its introduction by Taggart, pressure casting as applied to the whole field of dentistry has so completely revolutionized modern methods, and in the language of the definition has proven so capable of "contributing to one's material advantage," that all honor is due to W. H. Taggart, who, no matter what the court decisions as to priority of invention may be, was the first to bring it to our notice, and who deserves all the credit possible for its introduction.

This occurred at the anniversary meeting of the New York Odontological Society, June 15, 1907, in a paper entitled "A New and Accurate Method of Making Gold Inlays," *Dental Cosmos,* Nov., 1907.

This process, as described by Taggart, consisted in pressing into a properly prepared cavity a special wax which would burn from the mold without carbon residue; of carving this wax to contour and in occlusion; removing it by wire, which becomes the sprue, after investing (Peck's first used) and burning out; it was cast in pure gold at the boiling point in a special casting apparatus (using nitrous oxide and illuminating gas, known as Taggart casting machine). It is notable that besides inlays, crowns, bridge devices, and partial plates, cast in gold alloy clasp metal, were exhibited in the clinic.

W. H. Taggart.

"A Cast Gold Inlay": a Clinical Demonstration and Lecture, *Items of Interest,* Dec., 1907. Taggart, in this clinic, displayed four and five tooth bridges cast in one piece both against porcelain and by cementing on porcelain a full upper plate, and one with the Gilmore attachment.

In this paper Taggart's contention is thus summed up: "The actual time consumed in forcing the melted metal into the air-tight mold under the heavy pressure is probably but a fraction of a second, but the success of the whole process depends upon the speed."

Taggart describes the gold as being "a great number of degrees beyond this actual melting point. While it is in this freshly molded condition, the pressure is maintained for a few moments in order to allow the molten gold to thoroughly congeal. Either this continued pressure

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prevents the gold from contracting or the amount of expansion in the hot mold is equal to it. At any rate, the filing fits."

He concludes: "I have kept pace with all former molding processes and find that by the time the metal is melted and poured into the mold by gravity it has become chilled enough to be thick and not in a thin liquid form necessary for a dental casting. My process takes advantage of every fraction of a second."

In this discussion Taggart accentuated principally the time-saving element of the direct method, but mentioned the indirect method, suggesting amalgam die, etc., for laboratory work.

W. H. Taggart. "Technique of Making Inlays and of Investing and Casting with the Taggart Casting Machine," ITEMS OF INTEREST, April, 1908. Improves his original technique by insisting on always having wax softened in water, steady temperature not above 138° F., sprue No. 16 wire (large as sprues now are), a measuring device for proper weight of water and investment, and improved technique in mixing and flasking.

Before proceeding further, the cardinal considerations of pressure casting must be mentioned if we are to intelligently review the literature. They are, beside the question of cavity preparation in inlay work and the correct preparation of the surface to be copied in other work, as follows:

(*a*) The type of wax used in the pattern, its condition and temperature when forced into and taken from the object copied and when invested.

(*b*) The investment, formulæ, mixing and refractory qualities, temperature when mixed, behavior when heated and cooled, etc.

(*c*) The various ideas as to drying and turning out the wax, of heating up and cooling investment.

(*d*) Casting in cold or hot mold.

(*e*) The metal: its purity and fluidity, its temperature and alloys, its contraction, etc.

(*f*) The machine and the way it applies its power, and the different types of power.

Van Woert. As an exponent of one type of indirect method applied to inlays, the articles of Dr. F. T. Van Woert, "The Technique of Inlay Making by the Direct and Indirect Methods." ITEMS OF INTEREST, 1913-14, are here condensed.

After describing these methods the author recommends Taggart's wax and his method of softening it, as well as carving and smoothing the wax form. His article is an argument favoring the indirect method, and he shows that a correct impression in cups original with the writer,

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can be made by using Kerr's modelling compound, and models constructed of silver and tin amalgam. He makes the same claim for accurately copying a root for crowning; insists on small sprue, as a common pin, located at point of greater bulk of pattern; new gold for each casting, as it is seriously affected by every re-fusing. Models on articulator are not reliable for obtaining occlusion, and bite should be taken in Taggart's wax like the pattern in the direct method; this can be carved to occlusion and makes possible the carving of occlusal facets; favors casting in cool mold and believes large pieces are practical.

As an exponent of another indirect method applied to inlays may be mentioned Weston A. Price, whose reports are condensed herewith. His method consists in "taking an impression of cavity tooth walls; contiguous tissue and approximating contact, the making of a model from this impression in artificial stone and casting into invested model under very high pressure."

W. A. Price.

"The Laws determining Casting or Fusing Results: their Control; and a New and Rational Technique," ITEMS OF INTEREST, May, 1908. In his research, Price, by a very ingenious device and the casting of bars 1 in. in length in a fused quartz box, because of the shrinkage variation of investments, reports the expansion and contraction per linear inch of gold and its alloys. "The contraction here varied unduly as compared to the expansion; for example, pure gold cast under one pressure contracted eighteen-thousandths and under another pressure only fourteen-thousandths, and under another and very low pressure twenty-thousandths." He concludes: "If we are to get constant results we must use constant pressure, and to secure the least contraction we must have the pressure as high as possible without distorting the investment." He then explains the relation of the "actual effective pressure, which varies through enormous ranges with some casting investments; with gas or air it is equal to the cross section of the inlay or mold, not the gate or sprue, in fractions of a square inch divided into the pressure per square inch of the gas. . . . If the cross-section of the inlay is ⅛ in. square it will be ¼ lb., less the back pressure, which finally reduces it to be less than ⅛ lb. actual pressure. . . . With the centrifugal machine the actual effective pressure is the weight of the mass of molten gold, multiplied by the square of the velocity of the gold in feet per second, divided by the radius of the circle it moves in, divided by 32 to change poundal into pounds pressure. . . . Half an ounce of gold revolving at ten revolutions per second, in a diameter of 10 ins., will produce 2.14 lbs. pressure on the inlay. With a casting machine giving 1/100 lb. actual pressure on the inlay the total contraction of pure gold will be about twenty-

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thousandths, or 2 per cent.; with 5/12 lb. the contraction is thirteen-thousandths inch; this is one-third nearer perfect fit than the inlay made on 1/100, amounting to a considerable factor in a long bridge."

Investments. Some investments expand and some contract, but none expand enough to correct the errors in contraction of the metal. Distortion of investment "will be small if the volume of the investment is large everywhere as compared with the size of the cavity or mold and heated evenly and slowly; . . . a large cast must not be made in a small investment cup."

W. H. Price. "The Behavior of Gold in Fusing and Casting," *Dental Cosmos,* March, 1911. *Tests of Waxes.* Wax pattern 107° F. in cavity chilled to 67° F. contracts 1.2 per cent.; this error is carried forward if invested at room temperature; if heated at time of investment to 130° F. it will expand 2.4 per cent. larger than when the pattern was in cavity. Price claims that this enlargement will not correct the error of gold contraction (which is 2 per cent.) because it is not uniform and because of the distortion produced by the elasticity of heated wax in cooling, and proves that working the wax produces unusual distortion. Two bars of gold cast under identical conditions from two patterns, the one of worked wax contracted 6.7 per cent. and the cast wax pattern expanded 2.7 per cent From a long list of waxes tested, contraction ranged from 2.3 per cent. to 0.6 per cent., which is the minimum for any wax, the formula for which he gives herewith:

PRICE'S WAX

Pure white gum	110	per cent.
" tamarac	10	"
" beeswax	15	"
" paraffin	10	"
" stearic acid	1	"

He says, however, "that all of the contraction errors can be controlled by reheating when investing (there agreeing with Van Horn) if the condition of the wax is not one of internal stress or stretch," and claims that elasticity "is always active when wax is cooled under stress," which is the case in nearly all inlay wax patterns, and he criticises the direct method of Taggart on these lines.

The setting of all impression materials is shown to be a slight expansion of a fraction of 1 per cent. and is a negligible quantity. *A very important element* is the expansion and contraction of the investment material produced by burning out the wax pattern; he furnishes a very valuable table showing these changes and at what temperature the investment should be cast into, to secure maximum expansion of mold. to

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offset unavoidable contractions in metal, and shows the error of allowing the investment to cool after heating to dry out wax before casting it.

Pressure of Melted Gold upon the Investment.

He proves that "the strength of investing materials when entirely cold is much greater than when hot." A table showing the Price investment as standing best, calls attention to the fact that investment's coefficient of expansion is several hundred degrees less than that of the metal cap or ring carrying it, hence they do not sustain or support the investment.

After a thorough survey of his work (ITEMS OF INTEREST, May, 1908, review herewith), which was only taken to the sagging point of bars, he finds only 0.5 per cent. defect in contraction to correct as being as recorded, 2.20 per cent. linear as against 2.25 per cent.; hence 6.60 volume instead of 6.65. These figures are always a fixed error to which we must adapt our technique by producing some definite error elsewhere to neutralize them. This is best done by uniformly enlarging mold which is to receive it; in this he again agrees with Van Horn.

Price shows that if we cannot control contraction we can control its location and have it appear in the sprue by having gold molten in sprue, while inlay is crystallizing; in other words, a larger amount of gold in sprue in proportion to inlay, and a large gate; hot investment and high pressure. Eight ounces positive pressure on square surface ⅛ in., equivalent to 40 per cent. pressure, moves pure gold to only 30° F. below its melting point; 24 ozs. 120 lbs. pressure moves it to 200° F. below its melting point. These are very high pressures (*see* references about loss of pressure), and can only be used in strong investments, such as "Artificial Stone," which is a silicate cement originated by him—formula herewith:

PRICE'S ARTIFICIAL STONE

Pure Silica	20 parts.
Calcium hydrate	19 "
Aluminium oxide	42 "

Price claims that artificial stone is so strong that the cooling gold cannot crush it, but will itself be stretched. Gold cast into it with blowpipes drops out; with low pressure it falls loose; with high pressure it becomes necessary to split investment. The same is true, he claims, of rings cast to fit mandrel.

W. A. Price.

"Casting to Models, its Advantages and Technique," ITEMS OF INTEREST, Sept., 1910. Price's method admits that gold contracts 2 per cent. or one-fiftieth of its dimensions in all directions; that a dental joint cannot be made by any of the present methods closer than 1/1,000 in., while it

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should be 1/10,000; hence he suggests that the cavo-surface angle be bevelled in all directions and then closed by burnishing, while the inlay is setting. He opposes casting direct to porcelain, but believes in the great advantage of artificial stone in casting large pieces or copies because of no contraction; also crown and bridges, both in section and grouped dummies; partial and full plates, can also be cast with little contraction.

Having briefly outlined the two types of indirect methods and produced the arguments of their prominent supporters, we turn again to some reasons why the direct method should be used as given by Ward.

M. L. Ward. "A Consideration of the Casting Process, with special reference to Refractory Material," *Dental Cosmos,* Sept., 1909. Dr. Ward reviews the three articles of W. A. Price, quoted, but does not agree that "an artificial stone" model, which expands sufficiently to counteract the shrinkage of the gold and high pressure in casting, is necessary, nor will it correct the evil, saying his methods are not the only ones pursued by engineers in such work.

Ward disagrees first. While he grants the shrinkage of gold as liberal as deduced by Price, 2 per cent., he claims that this was for bars, and takes the wheel as more typical of the inlay, stating from tables given that while an iron wheel 10 ft. in diameter had a linear shrinkage of 1.08 in. per ft., one 2 ft. in diameter shrank only 0.115 in. per ft., so that castings of iron ¼ in. in diameter only shrink 0.0004 in. Accepting Price's determination for gold at 2 per cent., which is twice that of cast iron, he says: "We can only calculate a shrinkage of 0.0008 in. for pure gold; seated in the center of the cavity this leaves 0.0004 in. of cement in each side." He further explains that "it is not necessary to counteract the shrinkage of gold in casting by high pressures and artificial stone models." Shrinkage "can be prevented beyond the limit of human errors in other parts of the technique if we cast into a dry cool mold;" necessary to have the gold as fluid as possible, but not boiling; the mold as cool as possible and cast quickly (making an oxyhydrogen blow-pipe absolutely necessary). (Note that this is confirmatory of Dr. Taggart's original recommendation.)

Ward emphasizes not only purity of gold and of alloys of gold and platinum, but insists that repeated heating produces sluggishness and destroys fluidity, no matter how pure the metal.

Investments. He states that ferric-oxide, a common impurity of silex, in an investment destroys the color and fluidity and raises the melting point of all pure metals. He goes very thoroughly into the refractory substance both

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chemically and physically unused in investments, and emphasizes the value of the well-known expansion of silica to counteract the contraction of plaster and insists that the size of the flint is also important, giving the following formula for dental concrete:

No. 200 Flint	30 cc.
XXX Silica	36 "
Plaster of Paris	17 "

(Flint should be increased in coarseness for large pieces.)

Ward reports a study of the pressure on different investments on the market, concluding that the fine ones, after heating, will scarcely hold together while being placed in the dynanometer; the coarse ones are stronger, though less uniform in change.

He emphasizes the importance of definite pressure in casting which can be maintained, and says of this formula for investment that "if these plans are carefully carried out the movement appears to be practically nothing, the expansion of the silica counteracting the shrinkage of the plaster."

Van Horn. A vigorous defender of the direct method is found in C. K. Van Horn, whose method ("Concerning Casting Methods and Casting Services," *Dental Cosmos,* June, 1911) consists in making a wax pattern in the tooth cavity, expanding the pattern by having the investing material and flask at a temperature sufficiently above the normal body temperature when this pattern is invested to compensate for shrinkage of the gold, which is in excess of the expansion of investment.

"Four Casting Failures and Remedies," *Dental Cosmos,* Aug., 1912. Van Horn sharply disagrees with Price on a number of points, and particularly objects to his cavity preparation, which anticipates long bevelled edges or laps in the inlay which have to be modified and burnished in cavo-surface angle adaptation, claiming that it stretches and hardens the gold; that the cement line will come up under occlusal stress, and with him and F. G. Lane, Van Woert agrees.

Van Horn. "Casting: A Review and Commentary, including a Technique which makes possible a Casting of the same Size as the Wax Patterns at Body Temperature," *Dental Cosmos,* 1910. He favors the direct method because, first, as he points out, "A cylinder of pattern wax approximately 3/16 by 1/2 in. when passing from normal body temperature (98.6/10) to temperature of the water with which we ordinarily mix our investment (54-56° F.), will shorten some 0.001/4 in., and the same rule he insists applies to impression compounds, or wax methods, such as Price's, hence the impression in Price's should be expanded as he (Price) recom-

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mends the expansion of the wax pattern. As to casting apparatus, knows of none on the market which will give a cold mold at the moment of casting, nor of one which will allow 300-600 lbs. pressure per square inch; considers it useless to so theorize, and says that while no machine is perfect, the vacuum method is the most tractable.

"The Wax Pattern: A Technique together with Appliances, etc., for its Execution," *Dental Cosmos,* Sept., 1912. Van Horn introduces a series of wax patterns, forms which approximate the cavity formation. He says: "The scientific consideration involved is that pattern wax is very susceptible to physical effects of heat, and that advantage is taken of the difference in the coefficient of expansion of the wax and that of investing material under the same thermal influence."

His argument against the Price artificial stone method is that at its highest efficiency it still leaves, as Price admits, so much shrinkage that the cavo-surface angle has to be chisel-bevelled, as does the filling, and the area of leakage has to be closed by burnishing.

"Standardizing and Investing Process and Simplifying and Casting Process," *Dental Cosmos,* Oct., 1911. Van Horn agrees with J. G. Lane that it is anatomically impossible "to take an accurate impression of the interior of an approximo-occlusal cavity, the exterior of tooth involved, the contiguous tissues and a part of the approximate tooth without distortion, unless the tooth walls be sacrificed in cavity preparation." He further argues: "Then add to this the further uncertainty of perfectly reproducing the parts in the model and of casting in the invested model under the exceeding high pressure of 300-600 lbs. per square inch, without distorting the investing material which envelops the model." Van Horn has certain hard wax forms which he presses into the cavity; removes and covers them with liquid wax kept melted in a special device (the wax softener); this to a degree compensates for the defects and gives good results by the direct method. He emphasizes again the statement that "it is absurd to assume that a casting fitting the cavity perfectly will result by following any process which does not provide a means of controlling and determining with accuracy the temperature at which the wax pattern is invested. . . . Wax pattern should never be subjected to cold water in the cavity, but always to warm water. ("Some Phases of the Casting Process," *Dental Cosmos,* May, 1909.)

His conclusion is "no process, no material, and no device has yet been evolved which would produce two gold castings of the same size for the same cavity unless those patterns were invested at the same temperature."

He does not recommend casting against porcelain, but says it can be

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done, and submits specimens, provided investment be hot enough; he agrees that the field is limited.

J. G. Lane.

"Casting; a Retrospect," *Digest,* vol. xv, page 436, favors the *direct method* because of "only three transfers, *i. e.,* cavity to pattern, pattern to investment, investment to gold." Objects to *indirect method* because of five transfers, *i. e.,* cavity to impression, impression to model, model to pattern, pattern to investment, investment to gold; also argues that there are four transfers by the "artificial stone" method, thus introducing error. Objects to impression methods because of distortion produced by attempting to obtain not only interior of cavity, but the exterior and that of adjoining teeth. Disagrees with Ward that flask should be just so cool as to be handled; this will do for small, but for compound fillings flask should be as hot as possible, saying that "the lower the temperature of the flask the greater the shrinkage, and that the approximate amount of shrinkage desired shall determine the reduction of temperature in the flask at times of casting." Does not agree with Baker's figures (*Dental Review,* pages 130-131) regarding expansion of investment in iron and brass rings and Pecks' compound at different heats, saying: "On the Taggart and Jamison machines with brass rings it is possible to get a casting almost the size of the flasked pattern, but absolutely no larger."

Investment Material.

Investment material, says Lane, should expand sufficiently to follow up the expansion of the brass flask which contains it. This will stand 45 lbs. per square inch (Results of Experiments, *Pacific Gazette,* vol. xvi, page 586). This investment showed best results.

By Weight

Cast plaster	1 part.
Powd. silex	2 parts.

Castings made with this Investment compared

Compared with Pecks			83/100	of 1	per cent.
"	"	W. S. White's	18/100	" 1	" "
"	"	Lane's formula	16/100	" 1	" "

The above were made in hot molds and again in molds with same technique and investment, and then allowed to cool so they could be held in the hand with a loss of 1.64 per cent. by shrinkage in plaster and silica casting pressure above 25 lbs. air per square inch.

Why Pressure is Needed During Casting.

Lane says (*Dental Digest,* vol. xv, page 98): "The only reason why any pressure is needed is that the molecular attraction that holds the mass of matter, gold, in globular or spheroidal form is greater than the force of gravity, and the gold there-

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fore will not by force of gravity flow down on mold without assistance" (*see* experiments). Great objection to Price's method; distortion due to tooth contour in removing large impressions, and "for all practical purposes it is a geometrical impossibility to distort the mold should shrinkage of investment occur."

"Investments for Casting Molds," *Digest*, 1911.

J. G. Lane. Plaster making up a heavy percentage of all investments always "turns smaller"; he says, " a simple ocular test for any investment is, if a line of space occur on heating, between investment and flask that is sufficient cause to cast aside such investment."

Herewith tests of investments. Flasks all red hot.

Tests of L. D. Caulk investment, loss per cent.	.14 of 1 per cent.
S. S. White	.18 " 1 " "
I. D. L.	.56 " 1 " "
Standard	.60 " 1 " "
Consolidated	.84 " 1 " "
Peck's	.86 " 1 " "
Terra plastica	1.28 " 1 " "

He says: "It will be observed that this method of testing follows exactly the line of technique that we follow in our regular work, and the findings are not merely statements of measurements and figures, but are statements of facts as they attain in our daily practice."

The highest measurement records a loss of approximately one-seventh of 1 per cent. by shrinkage; the investment compound represented in this particular test shows no trace of a line of space between the flask and its contents when heated to redness: the investment expanded as much as the flask which contained it." As a second test, all flasks allowed to cool down to room temperature, flasks lukewarm; temperature exposed to oxyhydrogen flame for only twenty seconds, with the result that contraction was vastly greater then with hot flasks.

RESULTS HEREWITH

L. D. Caulk, loss per cent.	.88 of 1 per cent.
S. S. White	.92 " 1 " "
I. D. L.	1.30 per cent.
Standard	1.34 " "
Consolidated	1.68 " "
Peck's	1.60 " "
Terra plastica	1.95 " "

Hence Lane declares that "the importance of casting in a hot mold cannot be overestimated," and insists that "a hot mold is stronger than

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one that has been heated and allowed to cool." Lane recommends, finally: "If it is necessary to have a casting with an absolute zero measurement (or greater than that) expand the pattern by flasking it in a warm investment, according to the technique of Van Horn."

In the discussion of Lane's paper ("Manual of Casting," page 10) his attitude toward the artificial stone process is well outlined as follows:

Lane's Views on Artificial Stone.

"While we must admit that Dr. Price has worked out a beautiful technique in theory, yet we have not been able to obtain from his writings, and we believe we have read most or all of them, certain data, or technique, that must of necessity belong, in order that his technique may obtain as he claims for it. This data is the temperature that the mold must have at the moment of casting and a means of determining that temperature. Dr. Price has ingeniously devised an artificial stone that has a permanent expansion equal to the normal expansion of gold up to its fusing point. Granting this equalization, then any rise in temperature in the flask at the moment of casting means an increase in the size of the casting over and above zero measurement. In order to roughly demonstrate to you the effect of variation of temperature in the flask at the moment of casting, we have here a small mandrel on which are two gold rings. The mandrel has a taper of one degree. The patterns for the ring shown here were made at exactly the same point on the mandrel. Both were invested in the investment material that we have advocated, and from the same mix or bowl of batter. There could, therefore, be no possible difference in physical conditions thus far. One ring was cast in a mold as hot as the fusing point of the brass flask which contained it would allow, and the other cast in a flask that was cool enough to handle with the fingers at the moment of casting. You will notice that one ring drops to within the tiniest line of the point where the patterns were made, and the other ring stops about 3/8 in. further up. Therefore, in order to make a given technique, complete data for the temperature of the flask at the moment of casting should be given.

"The figures given us by Dr. Lodge—giving the effect of pressure as determined by Dr. Price—are in error. Dr. Price obtained these figures by experimenting in casting with a centrifugal machine."

"In the same article, in the ITEMS OF INTEREST, wherein Dr. Price gives us these figures, he states that "in computing pressure in such a machine the entire mass of gold in the crucible is available and must be reckoned in computing the pressure on the sprue area. This is unquestionably an error. An inflexible law of physics teaches us that the only bulk of gold available for pressure and computation under such condi-

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tions is a bulk equal to the area of the narrowest part of the sprue opening, and the length of which is the height of gold in the crucible. All the remaining bulk of gold that fills the rest of the funnel-shaped crucible adds absolutely nothing to the pressure on the actual sprue area. Therefore all the figures that are based on this theory and method of computation are certainly in error."

From J. G. Lane, "The Casting Process as Applied to Inlays of Gold and other Dental Uses," *Dental Digest,* July, Aug., Sept., 1909, we make the following notes:

Lane.

1. Does not favor casting on porcelain.
2. Casts gold bases for loose pin crown.
3. In bridge work, waxing up dummy to long pin facing or saddle back tooth, removing and filling holes with graphite.
4. Opposes casting, even small bridges as a whole, on account of shrinkage.
5. Recommends casting part of pyorrhœa splints.
6. Recommends casting pure aluminium as a full plate base and claims disintegration of the early work was due to impure metal; says aluminium may be cast directly against teeth if not encircled by wax. Partial plate may be cast in gold.

You are referred to the article of L. W. Strycker, "Ancient Origin of Dental Casting" (*Manual of Casting,* page 5) for valuable historical data relative to pressure casting, and we quote him as follows:

Strycker.

L. W. Strycker ("Investments for Casting Molds," *Digest,* March, 1911) claims that an investment which expands outwardly will distort the mold inwardly and does not agree with Lane. Strycker insists that the micrometer test is useless in measuring inlays, saying it is not possible to make castings smooth enough to make measurements of any value in determining shrinkage. Emphasizing the importance of the location of the wax pattern in the casting ring, he says: "In vacuum casting the wax form is placed nearer the bottom of the ring; in pressure casting nearer the top." He concludes: "As the investment material is increased in amount the expansion will be uneven, and it will be greatest in the direction of the least resistance according to the length of the material involved."

Investments. L. E. Custer.

"Some Practical Points on Inlays," *Manual of Casting,* page 62. Objects to silex because of lack of smooth surfaces; suggests plaster of Paris, 1 part; fire clay (highly calcined), 4 parts. This fire clay will not shrink because it has been burned at a much higher heat than that of casting. 1 cubic in. at red heat will shrink 1/1,000 in.

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Shrinkage of inlay mold will then be one-fifth of 1/1,000, or too little to worry about.

"Mold should be dried and highly heated at time of casting; when casting in hot mold it is not necessary to have gold so hot."

Necessary to have the same pressure on gold in casting each time; best done on compressed air, gas, or steam machine; it is better to have enough gold to seal edges, preventing back air leaks.

In centrifugal machine have only enough to make a perfect casting and little excess, for "the mold is distorted by too great a head of metal or too high centrifugal speed. In this Custer disagrees with many.

C. J. Clark.

Dental Summary, Jan., 1911, "A Consideration of the Shrinkage of the Investment: "Investing the Wax Model so as to secure Minimum Possibility of Distortion." Explains that the lateral expansion of the inner walls of the mold takes place, and says: "Therefore the lateral expansion would be of an unequal and varying degree throughout the ring, registering the same degree of irregularity upon the inner circumference of the ring. Hence the inner circumference would no longer maintain the lines of a perfect circle, and the ring would be described as having become warped and the inner circumference distorted," and he displays a number of diagrams and specimens establishing these facts.

In speaking of the *expansion of metals,* C. J. Clark, "A Theoretic Consideration of the Expansion and Contraction of Gold when Cast under Pressure," *Manual of Casting,* page 9, claims a vast difference between expansion of gold in crucible and that forced and held in mold by air pressure. Relative specific gravity of gold is 19.16 and casting under pressure is combination of hydraulic pressure and welding, which develops a higher specific gravity than in ordinary cooling, thus 12 lbs. pressure of expanding gas will develop a density or specific gravity of 19.45. "There is no inherent force or physical property in the metal itself after being cast under pressure capable of augmenting its density to any further degree, so it is physically impossible for it to shrink. . . . Therefore, the discrepancy must be ascribed to some other factor or cause than the shrinkage of gold."

For an excellent analysis of the various machines and the methods of applying force you are referred to C. J. Clark's "An Analysis of the various Methods and Devices Used to Cast Metal under Pressure," *Dental Review,* Aug., 1908. He objects to the machines using compound air or gas as follows:

Gas Pressure Machines.

"1. The expanding gas chills the metal.

"2. The force employed is not restricted to expend its efforts where they would be most effective.

"3. No vent for free expulsion of the confined air.

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"4. Only the minimum amount of the pressure expended is utilized: the major portion of the pressure being wasted in being applied where it is a positive detriment to the efficiency of the machine."

Advantages of Vacuum Machines

"1. The metal is not chilled by expanding gas, but to the contrary, heat can be applied until the mold is completely filled.

"2. The confined air in the mold is drawn into the vacuum chamber before the metal is forced into the mold."

He concludes that centrifugal force is the best because

Centrifugal Force.

"1. No expanding gas to chill the molten metal.

"2. No pressure penetrating the investment enveloping the metal and assisting it to shrink.

"3. The air confined in the mold and gate is allowed to escape into the surrounding investment unhampered by any opposing force.

"4. It requires no expensive or complicated machine or operation."

Steam Force.

His objection to steam is that force is only momentary. He says: "When a wet pad is suddenly brought down upon a heated flask and over glowing metal steam is generated, a sudden spasmodic pressure is developed, but only for the instant, for as soon as the maximum heat has subsided, the pressure immediately diminishes, and as this occurs a vacuum is formed and the pressure on the molten metal is nil."

As bearing on the foregoing, we quote Kabell (ITEMS OF INTEREST, May, 1909. Reports a series of tests): "To show that the location of contraction was not affected by any pressure on the sprue and investment differently between 3 and 25 lbs."

W. A. Price questions this statement (*see* his articles).

C. P. Hinman.

"Technique of Casting," Feb., 1914, *Summary.* Gives the result of his long study of waxes, saying that the best wax consists of white wax, paraffin, and stearine, with the following properties. Wax gives plasticity, paraffin gives firmness, and stearine gives carving qualities. This should be very carefully annealed in hot water after it is made; this is very important. He advocates weighing investment and water, and states that in heating investment, changes in crystallization take place in the plaster (the base for all investments) about one hour after mixing, and that they can be stopped by heat; therefore the drying out should begin before the expiration of that hour. After burning out wax, allow flask to cool so as to cast in cool mold, otherwise inlay will be too large; from 3 to 5 lbs. pressure for casting, according to size, kept up three minutes after casting;

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use 24-carat gold usually and for contours 24-carat with 3 per cent. platinum.

We quote a valuable and practical procedure for control of shrinkage of both wax and investment in M.O.D. cavities recently reported by T. P. Hinman ("Technique of some Problems in Casting," Pennsylvania Society, July, 1914).

He states that it is applicable to all cavities involving three surfaces. By the indirect method a matrix of 3/1,000 pure gold is burnished and swaged with enough lap to protect the cavo-surfaces, investments and margins from breaking down, caused by molten metal being driven against it. This matrix is filled with cast wax, preventing errors of elasticity. These should be cast cool: they never need cavo-surface trimming, can be cast in any alloy, giving a pure gold margin.

Robert Le Cron.

"Remarks on Casting," *Dental Brief, Manual,* page 221). In prosthesis emphasizes the importance of the size of the sprue as small and multiple for gold; any reasonable size for light metals and aluminium; and still smaller for heavy metals as tin and Watts' metal.

This article is a most valuable contribution on vents and air cushion in casting large pieces.

He suggests perforating investment at distant points with fine broach and then sealing the flask end of perforation with a little soft investment; this holds the air cushion within and prevents heavy metals from running clear through; he emphasizes the fusing point of metal, saying "there is a certain condition of a molten metal at which that respective metal will cast to the best advantage and it is not the boiling point." The dangers of over-heating and of carbon flame are also mentioned. Claims that thin castings covering large surfaces can be made of gold following the rule (excepting Watts' and similar metals); "the heavier and greater the bulk of metal, and the thinner the object to be cast, the smaller the sprue opening and the greater the number of sprues radiating from a common center to various parts of the mold; and last, but by no means least, the flatter the crucible or surface upon which the metal is melted. . . . With small work the porosity of the investment should be quite sufficient (as a vent); by small is meant inlays, crowns, bridges, or any design within a radius of 2½ ins."

Cast Dentures.

There is a great divergence of opinion on pressure casting of base plates, many claiming that it is practised in gold and its alloys in partial dentures, and all are of the opinion that full plates are practical when cast in pure aluminium.

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Among the first to accomplish such castings were Bear and Zeller, and it is interesting to quote C. C. Carroll, who practised pressure casting of aluminium 1885-1886, to the effect to "maintain the pressure about five seconds to give the molecules of metal time to arrange themselves under pressure; otherwise there may be small pits over the surface of the denture."

R. C. Brophy. "The Scope of Casting in Dentistry," *Manual,* page 115. Practised successfully seventeen years, casting of full bases for dentures in alloys of aluminium, but says it is not practical to cast full bases in gold; approves and practises horseshoe partial or saddle plates.

Robert Seymour. "The Cast Aluminium Plate," *Manual,* page 131. Describes model made of silex coarser than for investment; 3 parts of silex to 1 of plaster; waxed up in Tenax wax; three gate ways; sprue of No. 10 wire or short wax, and a special separating flask allows removal of wax without too much heating; plunger machine with moist asbestos film for casting with gentle but firm pressure, vulcanite attachment for teeth.

D. D. Campbell. "Campbell's Cow Bell Method of Casting," *Dental Summary,* Dec., 1912, for casting aluminium bases, recommends C. C. Allen's investment (equal parts Portland cement and dental plaster), casting done by tipping cow bell on the flask in which investment is made; spaces must be left between teeth if metal is cast direct to them. After casting base, it is set on die and swaged, adding accuracy.

Harper and Olds. "Plate Casting by Vacuum Process," *Manual,* page 225. For constructing full upper and lower base, vulcanite attachment, models made of good investment compound coated with graphite to give smooth surface on cast; four wax gates leading to wooden sprue at heel of wax plate, which should be formed and carved with rim and retention lugs just as needed. Blowpipe flame not directly on metal; cast when fluid; flask hot.

G. H. Wilson. "Wilson's Cast Aluminium Plates," *Dental Summary,* Dec., 1911. Models made of wash silica and plaster of Paris, equal parts by measure. Teeth waxed up with beeswax on paraffin base plate; diameter of pouring sprue, 3/16 inch; two gates at heel of plate; casting done in Billmayer bucket; cast aluminium not practical applied to platinum pin teeth because aluminium is a solvent of platinum.

There is a divergence of opinion on practicability of casting splints in bulk because the gold does not burnish well on the edges; more agree with casting against backings or abutment fillings or crowns.

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Chayes. The various articles of Herman Chayes (ITEMS OF INTEREST, Feb., 1911 and 1912), "Telescope Crown," etc., describe ingenious casting idea and wonderful mechanism and casting results; also see the methods of Charles Ash (*Dental Summary*, 1913).

Herman Chayes is in favor of direct method; says alloys for inlays should be 5 per cent. platinum and pure gold. Believes in cast saddles, cast on direct line with the sprue and not at right angles to the section; thinks dummies should be cast and then assembled and soldered.

Goslee. As one of the original and most prominent exponents of the practice of pressure casting applied to crown and bridgework, H. J. Goslee's numerous articles in ITEMS OF INTEREST might be quoted were there time. We paraphrase from two:

(*a*) "The Extent to which the Casting Process may be Advantageously Applied to Crown and Bridgework," *Dental Summary*.

(*b*) "Removable Bridgework, "*Dental Review*, 1912.

Davis crowns and Goslee. Teeth are stronger when cemented in than when soldered in or cast; he says the color is better and is opposed to direct casting upon porcelain.

Bridges; fixed copes made by casting against 36 gauge pure gold swaged to amalgam die of root end.

Gold crowns; (little contour) suggests that cusps be cast into 28 gauge 22 carats gold band, fitted and contoured; (extensive contours) narrow band of 22 carat or platinum 30-32 gauge fitted cervically, then gold cast upon that.

Making dummies; casting separately preferred; when cast in section must never be over three or four.

Backings for Goslee teeth 24 carat, 38 gauge, are always best swaged to porcelain tooth first, before casting, to insure accuracy.

Facings used same way; contour and narrow saddles for cleanliness. Recommends uniting dummies by 22 k. solder, as against practice of casting in 5 per cent. platinum gold alloy and uniting with pure gold.

Removable Bridges. Opposed to casting of clasps because casting weakens and destroys resilience; much better made of rolled or drawn metal. Recommends Roach, Morgan, and Gilmore attachments and notes the great possibilities in casting for forming the body of the fixture, saying: "The successful casting of large pieces means development of proper technique." High-grade investment and strong properly stiffened wax forms. In this way, he says: "All forms and sizes of saddles may be cast and coin gold is especially adapted, because it is sufficiently strong and accurate."

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Casting Against Porcelain.

The subject of casting directly on porcelain is open to debate, and few can be found who believe it practical.

W. A. Sanderson.

"Porcelain Crown with Cast Gold Bar," *Manual,* page 14. When investing, add extra wire opposite sprue, which is withdrawn with sprue to allow escape of gas or air; this allows casting to thin edges on porcelain.

Precautions.

There must be no excess wax nor overlap on porcelain and investment should be heated as high as possible.

W. C. Gillespie.

"Casting, with special reference to Casting on Porcelain," *Manual,* page 217. Claims that porcelain is never checked by casting directly to it without backing; metals used 24-22-carat gold, no flux necessary. The ring, investment, and porcelain in the mold should be at a red heat; emphasizes the importance of careful waxing and investing.

The following men claim to cast on porcelain successfully: E. M. Carson, St. Louis, "Clinic on Cast Crown," *Cos.,* April, 1912; A. J. Bush, "The Cast Inlay and its Advantages," *Summary,* Feb., 1914, who prefers cold to hot mold and metal white hot and 24-carat gold.

Herewith a few other well-known authorities who claim it is practical:

Crandal, *Manual,* page 107;

Cunningham, "Casting Gold on Porcelain," page 120;

W. H. Hayden, "Casting Large Bridges," page 126.

A conservative majority, however, are opposed to casting direct to porcelain, as illustrated by Thomas E. Weeks ("The Possibilities of the Casting Process in the Use of the Various Manufactured Porcelains in Crown and Bridgework," *Brief,* June, 1911), who is opposed to casting on porcelain, and suggests to cast dummies individually; cementing on porcelain later, and uses platinum wire where casting has extra stress.

Any number of articles might be quoted relative to the various applications of the cast-metal base for molars, bicuspids, canines, incisors; the work of Goslee has been quoted. A few others are:

CAST METAL BASE; PORCELAIN CEMENTED ON.

Schlegel, G. S.	"An Ideal Bicuspid or Molar Crown," *Manual,* p. 1110.
Burris, C. J.	"Cast-Jointed Logan Crown," *Manual,* p. 80.
Lyon, C. J.	"Jackson's Method," *Dental Review,* 1913.
Haslett, F. W.	*Dental Summary,* Jan., 1912.

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Hutchinson, T. C. "Making a Richmond Crown without Use of Solder," *Manual,* p. 129.

Thompson, J. M. "Description of an Interesting Case, Restored by all Porcelain Bridge and Bridges upon Cast Bases," *Manual of Casting,* p. 157.

Stallman, C. E. "A New Attachment for Abutments in Bridgework and Porcelain Crown, etc.," ITEMS OF INTEREST, April, 1911.

Metals for Cast Work.

The metals used in pressure casting and their alloys. All expert operators unite in opposing the use of scrap gold for any sort of pressure casting, and a majority are for pure gold for inlays, as C. O. Simpson ("Making the Most of the Casting Question," June, 1913). Many agree with Gillette (*Dental Summary*) that platinum and gold 2½ per cent. is the best for stress areas.

Others think with C. N. Johnson ("Experience with Cast Metal," *Review,* Dec., 1910) that contour inlays should be platinum, 1 part; pure gold, 24 parts.

The following prominent operators who believe in the restoration of perfect occlusion, reproducing planes, facets, and culci, are also in favor of a lighter platinum alloy to maintain those lines: "J. Lowe Young, R. Ottolengui, Henry Gillette, W. D. Tracy, F. T. Van Woert and T. P. Hinman (*see* reports).

We append the valuable report of Mr. Weinstein, whose laboratory so far as the reporter can discover, has done many successful large castings. He remarks on casting large pieces in gold:

Weinstein.

"Comparatively little of this work has been done generally for lack of not only apparatus, but proper gold alloys. The ordinary golds obtainable, such as 18- or 20-carat or coin gold, are all too soft when cast into large thin sections. Clasp metal, which may be anything from 14-carat gold very high in copper to 16-carat gold high in platinum, has proven unreliable on account of brittleness, etc. For the last four years I have used for this purpose the two following alloys (*see* B. and C. alloys). These two alloys are identical in tenacity and hardness and other general properties, as will be shown later. Their contraction in the cast form is lower than pure gold or platinized gold, and they make castings of satisfactory density and rigidity without brittleness.

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"The tables given below were worked out and will explain the procedure in developing the formulæ:

Casting Gold.

A.

Soft for Inlays, etc.

(*Nitrous Oxide or ordinary Blow-Pipe*)

Pure Gold, 60 to 90 parts; Plate No. 2, 10 to 40 parts, according to hardness desired.

Color and fusing point approximately same as pure gold when low percentage of No. 2 is used.

B.

For Nitrous Oxide Blow-Pipe

Maximum Hardness for Casting Sections of Bridge-work, Partial Dentures, etc.

Pure gold	80.0	parts
" Plat. Rhod.	8.5	"
" Palladium	3.5	"
" Silver	2.0	"
" Copper	6.0	"
	100.0	

Fusing point about 50° F. higher than pure gold.

C.

For Gas and Air Blow-Pipe

Maximum Hardness for Casting Sections of Bridge-work, Partial Dentures, etc.

Pure gold	80.5	parts.
" Plat. Rhod.	.6.5	"
" Palladium	2.5	"
" Silver	2.5	"
" Copper	8.0	"
	100.0	

Fusing point approximately same as 22-carat gold Cu.Ag Alloy.

"These alloys may be re-melted and re-cast without perceptible deterioration. No flux is required when making the actual cast, but a flux of a reducing nature should be used when melting up residue buttons for future casting. Potassium nitrate or similar strong oxidizing agents should never be used in connection with alloyed golds, for the simple reason that they oxidize just the elements it is desired to retain in a reduced metallic state and not in an oxidized state.

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"As a general proposition, large pieces should be cast in sections and united with solders of corresponding fusing point and color. A long, narrow saddle or section or a plate can be cast better vertically than horizontally. One sprue, 14-13 gauge B. and S., is ample as the shape of the pattern becomes a continuance of the sprue and the molten metal drops directly into the cavity (mold) and therefore in the line of least resistance. This applies particularly to casting long thin sections, and this method is more certain than where the sprue or sprues are placed at right angles or nearly so to the pattern.

"It is essential to have a perforation in flask base of casting apparatus so that the air cannot be compressed in the mold. This is a very frequent cause of failures in casting, particularly with pure gold."

He says of *sprues* and *pressures*: "Sprues 14 gauge to 13 gauge B. and S. are generally advisable. Seven to nine pounds air pressure is sufficient for inlays, sections of bridgework, saddles, etc. When very small inlays are to be cast, the pressure must be increased to 12 or 13 pounds, especially if the size of the sprue is decreased to 17 or 18 gauge B. and S. Multiple sprues are hardly necessary except in some rather rare instances, and it is not advisable to attempt to cast several inlays in one flask.

"In casting pure gold it is essential to use a small sprue and not too large an excess of gold, for the reason that pure gold retains heat much longer than alloyed gold, has a very strong tendency to globulate in a spheroidal form, and, if the excess is large and superheated and the sprue large the tendency is for the uncongealed residue button to draw the casting toward it and consequently either a separation of the sprue occurs or rounding of the margins of the inlay, or both.

Weinstein makes the following notes on the properties of alloying elements, which are appended because they are at variance with the accepted usages.

Au and Ag. Contraction approximately same as pure gold (not more).

Au and Cu. Contraction less than pure gold.

Au and Pt. Contraction more than pure gold.

Au and Pd. Contractions approximately same as pure gold (not more).

Silver does not increase hardness of gold (distinctly contrary to all works on dental metallurgy).

Copper increases hardness of gold approximately two and half times as much as equal per cent. by weight of platinum.

Platinum does not alloy uniformly with gold if over 10 per cent. is used.

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Rhodium, 10 per cent. Rh, 90 per cent. Pt, is used instead of pure platinum. Makes better alloys.

Iridium. Not used. Absolutely detrimental. Segregates and makes uneven alloy.

Palladium. Alloys perfectly, increases fusing point more than Pt, and is used to partly replace Pt and make more uniform alloy. More than 5 per cent. has strong decolorizing action, and therefore not advisable.

In discussing the advisability of a hot or cold mold, he says: "At the present time, owing to improvements that have been made along the line of wax, investment compounds, etc., the cold flask is unquestionably indicated, except possibly in the case of 'pick-up' (contoured pieces as a post of wire, etc.).

"It must be understood, of course, that the terms hot and cold flask are only relative, because with the usual casting methods in vogue when the operator starts out to melt his gold a very hot flask will cool down considerably and a very cold flask will heat up considerably. Consequently, the difference in temperature between the so-called initially hot or cold flask is not nearly so great as may appear at first sight."

Investment materials and wax patterns he reports as follows:

"The refractory compounds for casting process available now are superior to those obtainable at the time Price's artificial stone was introduced, and while the Price's method may have some advantages over the amalgam die method for inlays, I cannot find any other particular application for it. The investment compounds that contain graphite leave a good deal to be desired, on account of the difficulty of making *a dormant aqueous mixture* of graphite, silica, plaster, etc.

"The investment compound should not contract at all under any conditions, but should expand slightly so that it is absolutely tight in a slightly expanded casting ring. It is essential that it have this property, because we have not only the uncontrollable contraction of gold to contend with, but also the contraction of the wax from the time any pattern is formed until the investment is set around it. Consequently, any shrinkage of investment should be avoided.

An *expanding* soldering investment is essential. This matter *has been completely neglected,* as though there was no such thing as contraction in bridgework."

"It is unnecessary to repeat the investigations of Van Horn on this subject, as he has covered this fully. He is essentially correct on all points and it is absolutely impossible to cast an inlay with any satisfactory degree of accuracy *unless the principles laid down by him are followed.*"

Weinstein admits that it is possible to cast direct to porcelain, but believes it is not practical, and that the majority of operators are opposed to it because the contraction of the metal is ten times that of porcelain.

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Sixth International Dental Congress.

Brief Summaries of a Number of the Essays and Reports Prepared for the Various Sections of the Congress.

Section I. Dental Anatomy, Histology, and Physiology.

The Soft Fibre of Tomes a Tubular Structure.

By Dr. C. F. Bodecker, Berlin.

1. The contents of the dentinal canaliculi, according to the views generally accepted, consist of a solid fibre as described by Charles Tomes, surrounded by a sheath (of Neumann).

2. Author, however, claims the fibre in the living dentin is not solid, but is tubular in form. Neumann's sheath is co-existent with the tubes.

3. This tube, being a prolongation of the odontoblast, should be named "odontoblastic tube" or "tubular process of the odontoblast." The name thus describes its form and origin.

4. The odontoblastic tube contains the nutritive fluid for the dentin and the enamel.

5. The contents of the odontoblastic tube, which in life are fluid, coagulate upon the death of the pulp. This explains why many microscopic slides of dentin show the odontoblastic tubes as fibres.

6. If the fluid contents of the odontoblastic tube (coagulated by most fixing agents) are identical with the "soft fibre of Tomes" we are forced to conclude that a sheath inclosing the soft fibre is present inside of Neumann's sheath.

7. The walls of the cell (odontoblast) and those of the tube, as well as the contents of the cell and tube, are continuous.

8. The tubular processes of the odontoblasts will be shown in micro-photographs.

9. The tubular process of the odontoblast carries the circulatory fluid to the dentin and enamel (afferent), whereas the space formed between Neumann's sheath and the walls of the tube transport the fluid back to the pulp (efferent). By this theory Neumann's sheath for the first time receives a physiological importance.

The Amylolytic Activity of Saliva.

By. C. Lovatt Evans, D.Sc., Institute of Physiology, University College, London.

The amylolytic activity of the mixed saliva has been studied by the author (*Journ. of Physiol.*, xliv. 191, 1912) by a method which gives accurate comparative results, and it has been shown that the action very closely resembles that of malt amylase, both as regards the products formed (maltose and stable dextrin, and afterwards traces of glucose) and as regards the dynamics of the reaction. The method used has been shown to give better results than two of the commonly used methods do (*Ib.* xliv. 220, 1912). The influence of food on the amylase content has

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also been studied (*Biochem. Zeitschrift. Bd.* xlviii. 432, 1913); an increase in amylase has been observed after carbohydrate food, but not after protein and fat meals. The increase lasts for some hours, and the influence of psychic factors was excluded by sham meals of carbohydrate, which were without effect. The cause of the increase was shown to be an increased activity of the parotid secretion. Parotid saliva is about four times as active as the other mixed secretions of the mouth taken together. The importance of these facts in the physiology of digestion is discussed in the original paper. The author cannot agree with Pickerill that the only use of the saliva is to remove traces of starch from the mouth and thus prevent caries ("The Prevention of Dental Caries and Oral Sepsis," 1912, p. 160). Unpublished experiments made in conjunction with Mr. A. W. Wellings failed to show any relation between amylase content and dental caries. Moreover, the saliva of many animals not liable to dental caries is free from amylase.

The Staining of the Dental and Adjacent Tissues of Some Rodents by Means of Trypan Blue Introduced into the Animals During Life.

By A. W. Wellings, L.D.S. Edin., M.D.S. B'ham.

The recent developments of intra-vitam staining methods are largely due to the work of Ehrlich and others in chromotherapy.

Trypan blue is one of the benzidene series of aniline dyes. Its exact constitution is doubtful, hence it is impossible to represent it graphically.

It is, however, a derivative of the condensation product of tolidine with amino-naphtholdisulphonic acid.

Bouffard, of the Pasteur Institute, first described the appearances macroscopical and microscopical of the normal tissues of an animal under the influence of trypan blue.

Goldman described and worked out the histogenesis of stained cells found everywhere in the connective tissue throughout the body. He called them pyrrhol cells and identified them with Maximov's "Resting Wandering Cell," the rhagiocrine cell of Renaut, Metschnikoff's macrophage, and the adventitia cell of Marchand.

Up to the present time the effect of this dye upon the dental tissues has not been investigated, and it is with this object in view that the work here described is undertaken.

The developmental and mature tissues have been examined in rats, mice and guinea-pigs, the dye being introduced into the animal subcutaneously, or intraperitoneally (.01 grm. of color per 20 grm. body-weight of animal). The dose is repeated about the eighth day until the creature is in a high state of coloration. The animal is then killed, the tissues fixed in 10 per cent. formalin and sections prepared as may be desired.

Examination of innumerable sections prepared in a great variety of ways disclosed appearances from which the following conclusions were drawn.

Conclusions.

(1) It is possible to stain certain cells of the mature dental pulp

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and peridental membrane in the rodents mentioned by means of the intravitam application of trypan blue.

(2) Similar cells can be shown to exist in great numbers in the developing dentine papilla after calcification has commenced; all about growing bone, and in the connective tissue around the developing enamel, many of which lie closely to the cells of the stratum intermedium.

(3) The pulps of the teeth of persistent growth contain an exceptional number of stained cells.

The matrix of dentine and bone is stained very lightly, the colour disappearing quite soon. The walls of the dentinal tubules and the haversian canals do not stain, neither do the dentinal fibrils, but the periosteum stains deeply.

(4) The secondary dentine formed in the center of the pulp cavity of persistently growing teeth stains deeply.

(5) Enamel developing at the time of the introduction of the stain and that formed while the stain is in the body takes on a very brilliant color, which subsequently fades as calcification progresses.

(6) It is not possible to stain already calcified enamel by means of trypan blue.

(7) The die is distributed more or less through all the tissues of the mouth, the color being—

(1) In the plasma in which the tissues are bathed.

(2) In certain specific cells of the connective tissue.

(8) These cells are identical with Goldmann's pyrrhol cells, and are distributed throughout the body except the nervous system.

(9) They have pronounced phagocytic powers, and possess the property of wandering about the body in an exceptional degree.

(10) They are concerned in inflammatory and other pathological conditions, and in reparatory processes.

(11) They may also be chemical and nutritional factors in body metabolism.

Section II. Dental Pathology and Bacteriology.

Calcium Metabolism and Dental Caries.

By F. W. Broderick, M.R.C.S., L.R.C.P., L.D.S. Eng. Bournemouth.

Dental caries is due to the solution of enamel by organic acids, produced by fermentation of carbohydrate food-substances around the teeth.

If the saliva be sufficiently alkaline and in sufficient quantity, this acid will be neutralized at moment of formation and no caries can occur.

Alkalinity of saliva is due to inorganic alkaline salts, of which the most important is calcium carbonate in solution as a bicarbonate.

Utilization of calcium in the body is regulated by the ductless glands working one with another, some being absorbers of calcium, others eliminators.

Calcium in the body is found in two forms:

(*a*) Fixed in the tissues.

(*b*) Floating, *i. e.*, waiting to be utilized as required either as (*a*) or for repair purposes.

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If calcium elimination is increased or absorption is diminished, the floating calcium will first be affected and a low calcium be the result.

Later the fixed may become broken down and eliminated (osteomalacia).

The suprarenal, pituitary, and thymus glands are calcium consumers.

The reproductive glands are calcium excretors (Bell).

The thyroid is difficult to place: possibly it has several secretions acting in different ways (Biedl).

The ductless glands act as eliminators of toxins and any acute illness will throw a strain upon them. For a time they become hyperplastic and over secrete, and then follows a period of reaction and lessened activity with insufficiency of secretion, the result being, especially in childhood when reproductive glands are inactive, great increased excretion of calcium, and consequently lessened floating calcium in the body. The saliva will suffer together with other tissues, and becomes less alkaline. The parotid saliva, always the least alkaline in health (Schafer) may even become acid, therefore less able to neutralize acids formed by fermentation in the mouth and consequently caries results.

There is an intimate relation between the suprarenal medulla (which produces the adrenin) and the sympathetic nervous system, by way of the chromatin tissue which is peculiar to both. The injection of adrenin acts on the saliva glands in the same way as stimulation of the sympathetic, *i. e.*, it produces a saliva rich in salts. Consequently suprarenal inactivity would give a saliva poor in lime salts.

Utilization of lime salts:

(*a*) *Childhood.* For growth, the thymus holding the reproductive organs at bay until growth is complete.

(*b*) *Pregnancy and Lactation.* For growth of coitus and formation of milk. The ovaries here are also inactive and calcium utilizers have it all their own way.

In both these cases the calcium equilibrium may be very easily upset, and a certain amount of starvation result. N. B. Both periods of excessive caries.

(*c*) *Middle Life.* Calcium equilibrium most stable.

(*d*) *Old Age.* Excess of calcium stored in tissues, *e. g.*, blood vessels, joints, etc. The reproductive glands are not so efficient and normal calcium elimination is deficient.

N. B. practically no caries. Hard sclerotic teeth of gout.

I have found that the saliva of patients suffering from acute infectious disease is deficient in alkalinity (most markedly so in measles), that the calcium content was considerably less, and that both the alkalinity and the calcium content could be considerably raised by giving a polygland substance of suprarenal, pituitary and thyroid.

The action of the thyroid is somewhat difficult to understand as clinically, thyroid feeding increases the calcium excreted in the urine, and also patients with arterio-sclerosis do very well on thyroid. On the other hand in certain cases it would seem to act as a utilizer of calcium, *e. g.*, ununited fractures heal with great rapidity under thyroid medica-

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tion. Chilblains disappear rapidly when treated with calcium and thyroid, the action probably being that it enables the body to utilize fixed calcium temporarily for repair purposes. It also helps to regulate the action of the sympathetic nervous system (note its action on nocturnal incontinence in children). For this reason I added it to my polygland.

My conclusions are that the predisposing cause of dental caries is a diminution of the calcium utilizing power of the body, due to a want of balance in the secretions of all the ductless glands, brought about by any pathological condition causing an extra strain to be thrown upon them. Acute infectious fevers in childhood will be the most important, but pregnancy in women, with an unstable calcium equilibrium and any illness or run-down condition, may be responsible.

If this is so dental caries is a preventable disease, and the treatment (to bring the calcium index back to the normal) is in the hands of the medical profession, either by a polygland substance similar to the one I used, or possibly by calcium salts alone if the patient can utilize them. The results should be beneficial not to the teeth alone, but should shorten convalescence considerably by reason of the help and stimulation of the defective toxin eliminators.

The Aetiology of the Dental Caries.
Dr. Leo Fleischmann, Private Docent of the Vienna University.

The author's standpoint is contrary to the opinion of Miller, that caries constitute a mere parastitic disease, the caries of the enamel and of the dentine being in their pathogeny and their progress a thoroughly identical process. The author bases this his opinion on histological demonstrations as proved by sections across carious enamel (method Bödecker). He could state above all, as before him already Baumgärtner had done, that micro-organisms enter between the enamel rods, thus first reducing the interprismatic substance, rich in inorganic matter, while the prisms still remain preserved.

By further investigations it was proved that the prisms themselves get permeated by micro-organisms, and that they at last decay to a shapeless mass.

One sees, therefore, exactly the same phases as in the caries of the dentine, whereby the interprismatic substance plays the part of the dentinal fibrils and the prisms that of the dentine matrix.

The obsolete opinion that micro-organisms could only enter into some previously decalcified enamel is denied by the author as an *a priori* accepted and never proved supposition. Theoretically it may, of course, be possible that micro-organisms enter open-lying organic substances. That organic substance, in defectively calcinated or non-calcinated condition, partly can lie openly in the enamel on the surface—has been proved from different sides. That they occur at places of predilection (fissures, interproximal faces, and at the bottom of a tooth) has only been recently shown by Gottlid. The fact of the interprismatic substance decaying first cannot be explained by the action of acid, for we know that by the action of the acid the decay begins with the prisms and is followed by that of the substance. This fact can therefore only be considered as caused by bacteria.

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This is the reason why the author pictures to himself the proceedings of progressing caries in the following manner: that the micro-organisms enter on the face of the enamel the organic constituents, destroying the organic substance, and on this spot generating an acid, which again in its turn dissolves the calcium salts in the surroundings. The micro-organisms enter thereupon the decalcified prisms, destroying these as well.

The question whether the carbohydrates of the food likewise have any influence in this matter, the author prefers to leave open.

Considering all these theories, the principal difference lies in the supposition that, according to the parasitic theory the acid generates on the very spot—that is, in the tooth itself—and not outside of the tooth.

This parasitic theory of caries enables us to explain all the different phases of caries-immunity by far better than all other theories which allow the acid to generate outside the tooth, thus substituting a biological possibility for a chemical reaction.

A chemical reaction *must* take place.

A biological possibility *may* take place.

The Report of a Case of Extra-Capsular Odontocele.
By A. Allan Forty, Leeds and A. Hopewell-Smith, London.

The case which we are presenting under the title of an Extra-Capsular Odontocele is of peculiar interest—since I had the somewhat rare opportunities of observing it over a period of years—1906-12, six years in all.

During these six years I was enabled to study from a clinical point of view the slow but steady development of the tumor in the right maxillary incisor region, which forms the basis of this report.

The patient, a boy, G. W., æt. 8-9, was brought to me in August, 1906, on account of the unerupted incisor teeth in the right maxillary region.

The condition—as the plaster models show—was as follows:

Maxilla—First molars, right and left, had erupted, also the left first and second incisors, together with the deciduous canines and molars all in place. The condition of the mandible was normal in regard to development of teeth, but showed some contraction and crowding.

The right maxillary condition exhibited a fullness as if the successional teeth were about to erupt.

Owing to the unilateral absence of the incisors at about nine years of age I had a skiagram taken, and the interpretation I put on it was that the teeth present in the alveolus were the canine and incisors, but abnormally placed, therefore retarded in erupting, and I decided upon a waiting policy.

The earlier history of the patient was that he was a first child and forceps were employed at birth—evidently considerably compressing the head and lacerating the scalp—for a scar longitudinal in direction exists in his occipital region, and the other blade will have probably compressed the facial and maxillary region. Whether this has had any effect in predisposing towards the present condition is difficult to say; at any rate it was antecedent, and I record it as part of the history.

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The boy was backward in mental development—slow in speech and slow and deliberate in his movements, especially in putting on and off his clothes.

In January, 1907, as the swelling was increasing in size and no teeth appeared, I sought Mr. Lewin Payne's opinion in consultation.

Mr. Shenton skiagraphed the case for Mr. Payne, who was of the opinion that the three teeth were present, but possessing curved roots and abnormally placed. He inclined to the opinion that they would eventually erupt.

I suggested at this date a cystic cause of the retarded eruption—but the skiagrams rather negatived this, since no thickening of the overlying wall or capsule could be made out.

In 1908 I again had the case skiagraphed by Dr. Rowden. The result shows more clearly the three teeth, well developed but juxtaposed in abnormal relation—also the overlying wall of bone—but scarcely giving in clear definition the morphological peculiarities of the first incisor—to lead one to diagnose the condition exactly.

One can but assume that the special features of the first incisor and its capsule had not at this date developed to an extent to exhibit anything to lead one to suspect the developmental changes taking place.

In July, 1909—three years after first seeing the case—the second incisor pierced the gum—in rather a lingual position—about three or four years later than the average age for eruption.

At this date the deciduous molars had been replaced by premolars unusually well developed.

In April, 1910, the canine tip presented in a buccal position, *i. e.*, at about the normal time for eruption.

A skiagram the following year revealed the teeth clearly defined and an unusual shadow of the first incisor.

In May, 1912, the teeth in the maxilla were all erupted save the right first incisor, and the physical signs now were a rounded bony swelling painless to touch, at the most prominent part of which the hard wall was exposed owing to the mucous membrane thinning over it. This exposed portion was thought by the patient and friends to be the erupting tooth, but the examination with a probe proved its true nature to be bone.

I now diagnosed a dentigerous cystic condition, and another skiagram by Dr. Rowden shows beautifully the peculiar pathological excrescence on the unerupted incisor. A rounded mass of less dense texture attached to the lingual sulcus of the teeth—so I made out.

We then decided upon radical treatment, having waited six years; and the same month Mr. J. F. Dobson, Surgeon to the Leeds Infirmary, whom I called in consultation, undertook the operation.

A mucous flap was resected, exposing the bony enlarged rounded wall. This was chiselled away and the tooth was seen lying in a cavity rather deeply placed and rotated—making removal particularly difficult. On further bone removal, however, we rescued the tooth with its special features—more or less undamaged.

The cavity was scraped and packed, and healed most satisfactorily, with very little alveolar deformity—which was easily restored by artificial means.

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I recognized the importance of the specimen we were able to preserve intact from the point of view of development, and, collecting the fragments of bone wall—follicle remains—and tooth—I at once sought the aid of Mr. Hopewell-Smith, whose research into the genesis of cystic conditions is of such far-reaching importance in the study of tooth embryology.

The accompanying pathological report is furnished by Mr. Hopewell-Smith.

(I regret our inability to present the pathological report.—Ed.)

Section III. Dental Surgery and Therapeutics.

Replantation of Teeth in Severe Cases of Pyorrhoea Alveolaris.
By Sten Hager, Stockholm.

The method of the late Dr. Geo. Forssman.

The way in which a replanted tooth can be made to adhere to the jawbone is by resorption on the surface of the root and new growth of connective tissue and bone, but sometimes the entire root is destroyed, beginning at the apex. The root-apex of the extracted tooth is therefore replaced with lead after removing the pulp and filling the canal from this direction. All foreign substances on the root are removed, the periodontal membrane not being destroyed. Alveolus is made deep enough. Spraying with antiseptic. A retaining appliance made out of metal bands, fixed with cement, must remain for three months. My first replantation performed in 1909. Result excellent. Patients demonstrated before the Swedish Dental Society several times. Replanted teeth firmly fixed. This treatment is justified only in desperate cases. Most suitable for replantation are the six anterior teeth of the upper jaw.

The Treatment of Sensitive Cavities.
By C. E. Brown, Dundee.

The fear of dentistry and the need of more gentle and painless methods of treating sensitive cavities. New methods of doing so. Analyzed N_2O and O; neither convenient nor necessary. Ethyl chloride spray very useful when immediate treatment is required.

Hypodermic injections also very useful in certain cases.

Use of formaldehyde gas given off by paraform has the useful properties of hardening gelatine, rendering it insoluble and inflammable; works very quickly in the teeth of young people and on carious dentine; very irritating if used near the pulp; good deal of judgment required in its use. The use of para-mono-chloro-phenol preparation of carbolic acid and chloride irritating and strongly antiseptic and anodyne, used in cases where the caries has penetrated near the pulp. If a tooth has given sufficient pain to keep the patient awake at night it should be devitalized. The para-mono-chloro-phenol has a modifying effect on the arsenic giving much less pain. The dentine of young people much more porous than that of old dentinal tubes obliterated in the old subjects.

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An Ideal Cement for Stopping Root-Canals.
By Dr. Vincenzo Guerini, Naples.

An ideal cement for stopping of the root-canals can only be obtained by a method which permits of hermatically sealing the apical foramen without leaving compressed air in the canal, and which is carried out with a substance not only antiseptic, but also free of irritating properties, so as to avoid the possibility of an apical periodonitis or even of an alveolar abscess.

My cement perfectly fulfils all these requirements. The paste made with it can be shaped in small conical pin-like sticks, by rolling it between the finger and a suitable plate. One takes these small sticks with converging-forceps or other suitable instrument and introduces them into the root-canal, reaching and stopping the apical foramen and then compressing the cement in the canal-cavity. In ten to twelve minutes the cement is hardened and one can proceed to the stopping of the carious cavity at the same sitting. By the proper use of this cement no failures occur, and even in the cases when an apical periodontitis pre-exists, this becomes cured.

Section IV. Dental Physics, Chemistry, Radiography, and Metallurgy.

X-Ray Observations on Abcesses, Cysts, and Root Resections.
By Conrad A. Achner, Ph.D., L.D.S. Eng.

The writer desires to emphasize the following points:

1. The great importance of X-Raying every month in order to ascertain the condition of alveolus and hidden abscesses.
2. The darkness of the shadow on the skiagram indicating an abscess cavity depends entirely on the depth of the bone lesion and the amount of bone still intervening between it and the film.
3. One can diagnose a cyst from a granuloma on a skiagram by the shadow being of greater density, more defined regular outline, and the tendency of sometimes displacing the neighboring teeth.
4. The great importance of removing the entire root in extractions, the scraping out of abscess cavities, or removal of granuloma in order to prevent suppuration, formation of sinuses or cysts.
5. The presence of a shadow around the root apex, and the history of a sinus, is sufficient to denote the presence of a granuloma.
6. The correct way of reading skiagrams enables one to determine the extent of the bone lesion, and thus prevent waste of time by treating with drugs where a radical treatment ought to be performed.
7. A tooth causing an abscess cavity or a dental cyst, if otherwise in good condition, can be saved by means of apical resection.

The Hardening of Metals.
By T. Martin Lowry, D.Sc., F.R.S.

Metals may be hardened either by mechanical or by thermal treatment. The former process is the more general, since nearly all metals

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are hardened by cold-working, *e. g.*, by rolling, hammering, or wire-drawing. Two effects are produced (i) internal strains are set up in the metal (Heyn); (ii) the crystals are broken down, a hard, glassy, amorphous form of the metal being produced wherever slipping takes place (Beilby). The effect of annealing is (i) to remove the interial strain; (ii) to cause the amorphous films to crystalize; (iii) to cause the crystals to grow at one another's expense, so that the coarsely crystalline structure of the original metal is finally restored.

Hardening by thermal treatment takes place when steels (of various compositions) are chilled, and also in the case of some other alloys such as the aluminium bronzes. The hardening may be attributed to the fixation of a hard form of a polymorphous metal, but this is now held to be an inadequate explanation, and the hardness of chilled steel is ascribed, at least in part to strains set up by the sudden chilling or by incipient recrystallization.

Section U. Dental Prosthesis.

Porcelain Work.
By Douglas Gabell, M.R.C.S., L.R.C.P., L.D.S. Eng.

Porcelain powder cannot be packed to more than two-thirds fill any space; less will appear full.

This is the only cause of shrinkage.

There are other cases for distortion and fraction during fusing.

Maximum consolidation takes place at a temperature far below the advertised fusing points, and before glazing of the surface.

Time is as important as temperature in fusing.

The amount of shrinkage cannot be reduced, but the effects can be controlled.

Porcelains vary very little in strength and shrinkage, but very much in fusing points, working qualities, appearance, weight and solubility.

Platinum gauze and wire, correctly placed, can greatly strengthen and assist in the manipulation of porcelain.

Price's Artificial Stone is of great value in manipulating porcelain.

Porcelain body should be fused enclosed in an investment and not openly exposed in the furnace.

Some practical applications of porcelain.

Removable Bridgework and Saddle-Bridges.
By Dr. A. C. S. Angel, Copenhagen.

The root-canals must be easy of access, and the root as little weakened as possible. The bridges must be made so that they will fasten well and yet be easy to remove. When the bridge-pillars are molars and premolars they are cut down a little below half height, and the sides are made cylindrical (with a transverse section like that of the root). A

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cylindrical ring of platinum-iridium or platinum-silver with a cover of the same material, is made for cover to these and soldered to it. Over this another cylindrical platinum-iridium or platinum-silver ring is adjusted. To the exterior of the latter, on the visible side, is soldered a thin gold plate twenty-four carats fine. On the exterior ring the crown cover is cast with a buttonlike stop down to the capsule directly placed over the root. If a greater contour of the exterior capsule is required mesially or distally, a little of the upper edge is removed at this place, and the contour is restored by casting in gold on the ring together with the crown cover. When the bridge-pillars are incisors and canines, a thinner platinum-iridium or platinum-silver cap with tube fastened to it (which must not be too substantial) is used. Outside this is adjusted a platinum-iridium or platinum-silver ring a little thicker than the former. On this is soldered a cover and a pin fitting into the tube. A Steele facing is now ground on in such a manner that the foremost part of the exterior cap is removed. The tooth is now standing upon the foremost edge of the interior cap. The tooth is soldered to the exterior cap. The remainder of the foremost half-part of the ring of the exterior cap is then removed. The foremost visible part of the ring of the interior cap is covered with gold twenty-four carats fine.

Section VII. Oral Surgery and Surgical Prosthesis.

Dental Sepsis as a Predisposing Cause of Cancer.

By F. St. J. Steakman, D.P.H., M.R.C.S., L.R.C.P., L.D.S., Dental Surgeon to the West London Hospital; Dental Surgeon, Lecturer on Dental Histology, and Tutor to the National Dental Hospital and College.

Analysis of the deaths from cancer in England and Wales during the four years 1901 to 1904, showing the parts of the body most frequently affected. This proves that in the male 85.1 per cent. and in the female 86.5 per cent. of all cancer, apart from that occurring in the sexual organs, occurs in the alimentary canal and its associated parts. That long-standing chronic inflammation in the sexual organs, and in other parts of the body, are known to pre-dispose to the development of malignant disease. That the great majority of persons suffering from cancer in the alimentary canal have advanced pyorrhœa alveolaris, which has been present very many years. That this advanced periodontal disease is not nearly so common in persons not suffering from cancer. That there is no doubt that the constant swallowing of infective material from the mouth can, and frequently does, produce a chronic gastritis. That the majority of patients suffering from cancer of the stomach have had chronic gastritis for many years prior to the development of the malignant disease.

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Some Clinical Observations of Regeneration of the Mandible After Caries and Necrosis. By M. H. Cryer, M.D., D.D.S., Professor of Oral Sugery, University of Pennsylvania, Phila.

There is considerable difference of opinion as to the agencies responsible for regeneration of the bone. The writer inclines to agree with Macewen that the growth of bone does not depend upon the periosteum. The growth of the mandible depends on an interstitial process which varies in different portions of the bone at different periods of life. The regeneration of new bone is brought about through the working of the osteogenic system in the bone remaining.

Causes of loss of mandibuluar bone by necrosis.—Interesting cases are cited, the earliest found being those of Percy of Paris in 1791. General discussion of cases under the writer's observation. Periosteum is absent in many cases, having been lost by suppuration, but the great majority of them when properly treated recover without formation of sequestra. In severe cases sequestra are thrown off, but new bone is formed without loss of the contour of the face. Report of cases in which new bone has been regenerated to fill up gaps, or to reunite one segment of bone to another. Illustrations, X-ray and others, of cases of varying ætiology, such as tuberculosis, phosphorus poisoning, injections, use of hydrogen dioxide, and local septic conditions of the teeth.

Case of Abscess in the Neck, of Dental Origin, Cured by the Anti-Staphylococcic Vaccine. By Dr. B. Landete.

The patient was a man thirty years of age, of feeble constitution and presenting an abscess in the left side of the neck arising from periodontitis in connection with a molar tooth. After eight or ten days of fruitless treatment by warm antiseptic bath, extraction of the tooth, and disinfection of the wound and the mouth, treatment by vaccine was proposed to him and this gave very good results.

Four injections were applied with intervals of five days, the first injection being of half a cubic centimetre, and the last one of two cubic centimetres.

The patient felt after the first injection a great *local* and *general* reaction, as when twenty-four hours had elapsed he had an attack of fever. At the second injection he only suffered a very slight febrile attack, and this was six hours after application; during the following injections and notwithstanding the increased proportions, the patient was not in the least disturbed.

Improvement took place immediately after the second injection.

I am convinced that vaccines will afford excellent results in this affection.

Surgery of the Maxilla-Post Operative Treatment by Iodic Fillings. By Dr. B. Landete, Madrid.

After operation upon the maxillæ, there remain bony cavities which we commonly fill with medicated gauzes, and which take long to become definitely cured, and in the meanwhile require constant care.

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To avoid this inconvenience we have tried the filling of the post-operation bony cavities with different iodic pastes, the results being exceedingly satisfactory.

We used for the purpose Mosetig's iodoform mixtures, but objections on account of the smell has decided us to change the formula. The pastes consist of iodol-iodocresol-azodolene-nosophene, etc.—10 per cent. of these products to be mixed with 50 parts of spermaceti and 50 parts of cinnamon and lemon essences, etc. We still use local anæsthetics so as to avoid pain when filling the alveolus of the teeth extracted on account of periodontitis.

We use a glass syringe previously warmed, in order to make the paste fluid, as it becomes hard when cooling.

A New Treatment of the Maxillary Sinusitis.
By Dr. B. Landete, Madrid.

The well-known inflammation of the maxillary sinus has been treated by several processes, according to its character: empyema, pyosinus, simple sinusitis (pyosinusitis), or fungous sinusitis, caused by hypertrophy of the mucous membrane which covers the sinus.

More than a year ago (May, 1913) we first operated on a patient by our new extra-simplified proceeding. The case was a physician, suffering for fourteen months from nasal suppuration consequent on periodontitis of the first right upper molar, whose alveolus exhibited a fistula. We employed the first time the Caldwell-Luc radical operation, through the canine fossa, after local anæsthesia; careful scraping of the sinus was performed; we then proceeded to fill it with iodoform paste and immediately suture the mucous membrane.

The patient became completely cured, so that it was not necessary to operate further; the cure was therefore by first intention. We, so far, have treated about one dozen cases and employed different iodic mixtures or pastes—iodol, iodoanisol, iodocresol, azodolene, pellidol, etc., etc., all of them having been followed by marked success.

In presence of such results, we venture to propose this proceeding to our colleagues.

Toothache in the Toothless.
By. Dr. Med. Max Melchior, Chief Physician, Docent of Surgery at the School of Dentistry, Copenhagen.

It is well known that a patient may feel pain in an amputated limb, and that pain caused by a blow on the ulnar nerve is felt at the finger-tips; but less is known of the toothache, which is felt by the toothless, although its occurrence is not rare, and the pain is severe. The causes of trigeminal neuralgias are numerous; they may be central or peripheral, and the familiar causes of neuritis, such as alcohol and syphilis, may be responsible, or the condition may be due to constipation alone, as pointed out already by Charles Bell. The condition to which the writer draws attention was described by Gross (Philadelphia) in 1870, and has since been scarcely noticed. The pain is severe and obstinate, being neuralgic in character, and occurring in elderly, toothless subjects. It is situated

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in the remainder of the alveolar margin, or in the overlying gum, whence it radiates to the face and neck. The upper jaw is most often affected, and the area involved is usually very small. The soft tissues are less affected than in most forms of neuralgia of the jaws and face, and they may even escape entirely. When affected they are firm and adherent to the underlying bone and are cut with difficulty. The bone at this point is abnormally hard and ivory-like, and its inclusion of nerve-endings is the cause of the pain. Excision of this bone is therefore necessary for recovery.

Section VIII. Anesthesia. General and Local.

Improvements in Local Anaesthesia by Novocain-Suprarenin.

By Richard H. Riethmuller, Ph.D. Univ. of Pennsylvania, D.D.S., Philadelphia, Pa.

The modified instrumentarium consists of an automatic specimen jar with tightly clamped lid, and porcelain stand (to avoid oxidation) which allows for suspension of two syringes and one pair of aluminium tweezers (to avoid disintegration by iodin) in a modified alcohol glycerin solution; a glass tray with metal inset for resting sterile syringes and preventing accidental dulling and contamination of needles, with small covered tray for keeping needles, hubs, wrench and broaches in antiseptic solution; a bacteria-proof stock flask for Ringer solution. A new iridioplatinum needle constructed on the principle of the Gates-Glidden drill with weakest part near the hub to facilitate withdrawal of accidentally broken needle. Metal parts of syringe in contact with solution should be enamelled to avoid decomposition of solution. Statement of date of manufacture of tablets and tightness of rubber stoppers in tubes should be insisted upon. Ampoules should be tested in vacuum. Technique of injection to be practiced in green skulls and dry skull in which mucuous membranes have been reproduced in wax up to the reflection. Colorless iodin solution (iothion) advocated for sterilizing field of injection and operator's palpating finger. Location of mandibular foramen in mixed races, such as American, requires further anatomical study. Lancing of gums before extractions, blood-pressure studies, use of thumb in left mandibular injection, external mandibular injection in ankylosis and infection, draining of wound after apical root resection advocated.

Section IX. Oral Hygiene, Public Instruction, and Public Dental Service.

Dental Inspection and Treatment in London County Council School.

By C. Edward Wallis, M.R.C.S., L.R.C.P., L.D.S., Dental Surgeon and Lecturer to King's College Hospital, Formerly Dental Surgeon to the Victoria Hospital for Children, Chelsea.

Dental treatment for elementary school children in London is provided for by means of some twenty suitably located "Dental Treatment

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Centres"; several of these "dental centres" form part of general "School Treatment Centres," in which eyes, ears, throat, and minor ailments are dealt with as required.

The centres, though subsidized by the L. C. C., are actually provided and managed by local Committees of hospitals, dispensaries, medical men, etc.

The premises have to be approved by the L. C. C. and the Board of Education, and the dental treatment is under the supervision of the Public Health Department of the L. C. C.

Dental inspection is carried out in the schools by specially appointed dental inspectors, "in order to provide a sufficient number of children for the work of the centres"; these inspections are held weekly or fortnightly, as required, and each inspection session is followed by an "address" to the assembled parents on the care of their children's teeth.

The Dental Treatment Centres are worked as part of an organized scheme for the dental treatment of the school children of London, in which preventive and curative treatment go *pari-passu.*

The dentists engaged in inspection and treatment are part-time officers, as also are the anæsthetists, who attend at regular intervals; trained nurses are also provided by the L. C. C.

The general principle of treatment involved is the greatest good of the greatest number, and consists in rendering each child's mouth functional and free for each session.

Ten more "Dental Centres" are to be provided this year, which will make a total of thirty located as found necessary.

The Liverpool Day Industrial School Clinic.
By R. J. Erskine Young, M.D. Edin.

This clinic was started seven years ago, by the Liverpool Education Committee (in July, 1907), and therefore is almost synchronous with Cambridge—my appointment as Dental Officer dating from then. A serviceable equipment was provided, and I began work forthwith.

The first thing we did was to examine the teeth of all the Day Industrial School children, and this survey has been repeated regularly since that time for the benefit of new children.

(1) *They are thus examined quarterly:*
(2) *Their dental requirements are entered in a register carefully.*
(3) *All children from five years old are sent to me alphabetically.*
(4) *And receive treatment beneficially.*

"Save the first molars" is my motto, and then I do as much more as I have time for. The good results show in the physical, mental, and, I may add, moral welfare of the child.

I have to work for three hours on end. Shall I tell you the thought that helps and comforts me at times? It is this: "I am perhaps helping to save this child from consumption."

"Dental Disease and Tuberculosis" is the text of a sermon I should like to preach in season and out of season; of the connection between the two there is not a doubt. For every cavity filled, for every diseased tooth extracted, we aim and strike a deadly blow at possible tuberculosis. I wonder if this fact is known to 1 per cent. of our private patients?

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One sometimes imagines oneself conducting an educational tour all over the country, telling people that if they will have their 'teeth put right," they will help to diminish the death-rate, not only from tuberculosis, but other dread diseases as well. I would further emphasize the fact that dental treatment covers a multitude of sins. And this is what we are trying to do at the Liverpool Day Industrial School Dental Clinic.

Public Dental Hygiene in Norway.
By Dr. O. Smith Housken, Christiania.

After the Berlin Congress of 1910, the work for the treatment of the teeth of the children in the Public (Common) Schools received a fresh impetus. On November 1, 1910, the first dental clinic of Norway was opened in *Krishania;* shortly afterwards at Drontheim, subsequently at Bergen, several other towns, and in one country municipality, namely Aker.

All the clinics are municipal and subjected to the School Boards. The working expenses everywhere are paid by the municipal authorities, so that the treatment is free to all children. At all the clinics the beginning is made with the lower forms, going upwards in the school, and advancing annually by forms. On June 1, 1911, was founded the Norwegian Association for the Prevention of "Dental Diseases." A number of town and country municipal boards are entered as members, also official Sick Clubs, School Boards, etc. The Association receives an annual grant from the Government. By the aid of the Association has been published in print, "Dental Caries at the Age of Conscription," by Mr. Arentz, a captain in the sanitary service, in competition for a prize offered by the "Military Medical Society"; 8512 recruits from different parts of the country were examined by the military doctors. Only 5 per cent. had perfect teeth. On an average 11.4 teeth per individual were found to be damaged at the age of twenty-one. The public Sick Assurance (a Government and municipal institution) since its establishment is rendering free extraction of teeth to its members. In accordance with the resolution of the Storling (Parliament) of the present year, an aid may also, on certain conditions, be granted by the filling of teeth. The Government has commenced to appoint dentists at the Schools for the Abnormal, and at the Lunatic Asylums.

Practical Results of School Dental Treatment in the Promotion of National Health.
By Professor D. E. Jessen, Strassburg.

Public mouth-hygiene is of international concern. Nevertheless its importance has only been recognized within recent decades, but it has now been introduced into all civilized countries. The basis upon which mouth-hygiene must be built is School Dental Treatment, and consequently this is the object in view at present in all countries.

From 1892 the town of Strassburg contributed an annual grant of about 1,200 marks for the dental inspection of school children, and thus recognized the necessity of their dental treatment, and thereupon opened the first municipal school dental clinic on October 15, 1902. The work was begun with limited accommodation, a modest equipment, and only

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one assistant. Their yearly accounts amounted to 2,400 marks, and increased steadily to 11,400 marks in 1910. In the year 1911, when established in the splendid hygienic institution fitted out with model equipments, and specially built for the School Dental Clinic, the staff consisted of nine persons, and the annual cost amounted to 26,500 marks.

From the time of the opening of the School Dental Clinic 30,000 children were inspected, 70,000 treated, and in round numbers there were 75,000 fillings and 75,000 extractions in eleven years. Altogether the town of Strassburg had spent 152,000 marks on School Dental Treatment since 1892.

Soon other towns followed the example set by Strassburg. In less than ten years 213 School Dental Clinics had been established, having an aggregate yearly expenditure of 560,000 marks. Nearly two million national school children were entitled to be treated in the clinics, and altogether about 227,000 children received treatment in 1913.

It must be the task of School Dental Treatment to reduce the percentage of decayed teeth in the shortest possible time, and to increase that of the sound teeth in order to bring nearer the realization of our ideal of a completely healthy mouth of every child attending school.

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The European Meetings.

Never have dental meetings been held in such environment and amidst such stirring scenes as surrounded the Paris and London conventions. During the period selected by these associations events occurred which will make numerous dates live in history forever. The declaration of war by Austria; the mobilization of the Russian, French and German armies; the declaration of war by Germany; the invasion of Belgium by Germany and the declaration of war by England, were tremendous occurrences all crowded into a brief two weeks. In such times and under such mental stress unstinted praise should be given to all the men in executive charge of these meetings for what was accomplished, and especially for the hospitalities and courtesies extended at great personal sacrifice.

The Paris Meetings.

Of the Paris meetings it may be said, in spite of the fact that every day, every hour, brought the dread spectre of a World's war nearer, the committees and officers proceeded with the conduct of their prearranged programs with the same energy that would have marked their endeavors in times of greatest serenity, with the result that a real triumphal success was achieved.

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Editorial

The European Orthodontia Society and The American Dental Society of Europe, taking advantage of the fact that the London Congress would attract many Americans to Europe, invited many of their American confrères to accept places on their programs, thus making their meetings truly international in character. To further advance their purpose the two associations joined their dates. The Orthodontia Society met on Tuesday and Wednesday, July 28th and 29th; the American Dental Society of Europe on Thursday and Friday of the same week, and at the same place, the Hotel Continental, both societies uniting to present clinics on Saturday at l'Ecole Dentaire.

The Orthodontia Society's program included the following names: Dr. Chiavaro, of Rome; Dr. Calvin Case, of Chicago; Dr. Zielinsky, of Berlin; Dr. Ketcham, of Denver; Dr. Choquet, of Paris; Dr. Pullen, of Buffalo; Dr. Hecht, of Berlin, and Drs. Ferris, Butler, and Ottolengui, of New York. In addition, the list of clinicians included Dr. Jackson, of New York; Dr. Subirana, of Madrid; Dr. Lind, of Amsterdam; Dr. Korbitz, of Berlin; Dr. Lockett, of London; Dr. Law, of Berlin, and Drs. Anema, W. S. Davenport, Solbrig, and Villain, of Paris. This is certainly an international aggregation of names, upon which the committee deserves to be complimented. Besides these, such prominent visitors as Aguilar, of Madrid, Cryer and Guilford, of Philadelphia, and many others, were present and took part in the discussions. All the papers scheduled were read, and many most enjoyable visits to private offices were indulged in, so that the visitors and guests of the Orthodontia Society have the most pleasurable recollection of the earlier days of that memorable week.

The American Dental Society of Europe.

By Wednesday morning, the day set for the first meeting of the American Dental Society of Europe, there must have been great mental tension, which was most wonderfully restrained by the men in Paris who were managing the meetings and the social events. It should be recalled that many of these men had relatives, young men in the prime of life, who must answer to the trumpet call in case mobilization was ordered, and that every practitioner must expect to see his practice completely killed in case of war. Yet the writer is certain that not one effort was relaxed in the pursuance of the prearranged plans.

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No meeting was curtailed, no social function abandoned, and nothing was left undone which might contribute to the success of the meeting or to the comfort and entertainment of guests. And not one man uttered a word that disclosed his own anxieties until the last moment, at the complete conclusion of the men's banquet, which occurred on Friday night, when the great gathering of about two hundred of the most celebrated men in dentistry from all parts of the world suddenly discovered that mobilization of the French Army had been determined, and that the President of the Society, Dr. W. S. Davenport, had known this during the entire evening; had known, too, that his nephew must leave at midnight to join his command, and yet with supreme self-control and in most perfect manner he had acted as toastmaster in these unheard-of circumstances.

Since the writer's return to America he has learned that there is a possibility that Dr. Davenport may visit this country during the coming winter. If so, it is to be hoped that some entertainment may be arranged at which all those who were present in Paris may be in attendance to express their esteem and appreciation of his conduct at that never-to-be-forgotten banquet.

Like the program of the Orthodontia Society, that of the American Dental Society was international in character. Dr. Chiavaro, of Rome, Dr. Bryan, of Leysin; Dr. W. Capon, of Philadelphia; Dr. Eppright, of Cologne; Dr. McNeill, of Vienna; Dr. Boedecker, of Berlin; Dr. Ottolengui, of New York; Dr. Sturridge, of London; Dr. Gordon White, of Nashville; Dr. Francis Brook, of London; Dr. Wm. Dunn, of Florence; Dr. Chayes, of New York; Dr. Spring, of Dresden; Dr. C. N. Johnson, of Chicago; Dr. Carmichael, of Milwaukee, and Dr. Rhein, of New York, all read papers, and the essays presented were fully up to the reputations of these men and the transactions will form one of the most valuable volumes ever issued by the Society.

Social Functions.

A few words must be said of the splendid entainment afforded to the guests and the ladies under such trying circumstances. On the evening of the first day a banquet was tendered "to members, ladies

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and visitors" at the Restaurant Armenonville. This palatial restaurant, most picturesquely hidden amidst the massive forest trees of the Bois de Boulogne, is famous the world over. About three hundred were in attendance, and when seated, the ladies in their evening finery added such grace and lustre to the occasion that every American present registered a vow to "do this sort of thing when we get back home!" But can we? Perhaps it will be safer to let that beautiful Armenonville fête remain as a unique and marvelously beautiful memory. After the dinner there were no speeches, but all who wished repaired to the Grand Ball Room, where gracious chaperones introduced partners, and soon the room was crowded with dancers, the older as well as the younger element taking part. There was much applause when Dr. Calvin S. Case and his charming wife did the rounds of the room in a *valse,* to the strains of the ever-popular "Blue Danube."

The annual banquet, for the men only, was held at the Continental Hotel on Friday, about two hundred being present. After a beautifully served repast, speeches were made by the Provost of the University of Pennslyvania, Dr. C. N. Johnson, Dr. S. H. Guilford, Dr. Truman W. Brophy, and two or three others, the entire affair passing off most brilliantly, only to be shrouded in gloom at the end by the news that Germany had declared war, and that France would mobolize within twenty-four hours.

On the afternoon of that same day (Friday) Mrs. and Miss Hirschfield entertained the ladies at a reception and tea at their residence on the Avenue des Champ Elysees, and in the evening Mrs. William S. Davenport invited the ladies to attend a *Soiree musicale* at her residence on the Avenue Elisée-Reclus. This proved to be a most brilliant affair, and was much appreciated by the women who were thus so charmingly cared for while the men were banqueting. One would have supposed that enough had been done in a social way, and that in the dread circumstances the program for Saturday might have been abandoned. On the contrary, the clinics were conducted as announced, after which a set luncheon was served for the men in one dining-room of the Hotel Continental, while in an adjoining room the ladies were entertained by Mrs. Field Robinson at luncheon, which was followed by an automobile excursion to the Parc de Trianon, Versailles, returning via Le Parc de

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Malmaison, where Mrs. W. S. Davenport served tea at her villa, "Les Rochers."

At six o'clock on that same afternoon all France was placarded with posters announcing the mobilization of her entire army, while other bills notified strangers that they would be granted twenty-four hours from midnight on Saturday to leave French territory. Thus tragically terminated one of the finest series of dental meetings that the world has known.

The International Dental Congress.

And then London! On Friday afternoon the Paris papers printed a statement to the effect that all congresses scheduled for London had been abandoned. This was supposed to include the Dental Congress. Dr. Brophy arrived from London just in time for the banquet, and reported that he had heard nothing of abandoning the Congress. Still there was a doubt, until some of the London dentists cabled home and received a reply denying the rumor. On Saturday morning, by eight o'clock, acting upon the advice of Dr. Brophy, Dr. C. N. Johnson and two or three more started for London on the earliest Calais train. Others waited over for the clinics, but the majority had departed before sunset, or had secured places on the night trains. Wise, indeed, were those that took these precautions. A visit to the Gare du Nord, about eight o'clock on Saturday night, reminded one of some of Doré's illustrations in Danté's Inferno. The place was packed with a seething, wriggling mass of inhuman humans! Men and women pushed and swore, until New York's most crowded subway station at the busiest hour of the day, by comparison, would be counted a peaceful place of rest. No one made way for anyone. There was one exception. Two porters, each with one end of a coffin on his shoulder and crying *"Ouvrez pour le Mort! Ouvrez pour le Mort!"* were grudgingly granted a narrow passage. Thus this grim harbinger of the nearby future was finally allowed to take a train to its destination. Heaven or hell, no one knew nor cared.

After an hour of hard labor, a *Commissionaire,* with a fair proportion of his senses still in working order and with a sufficient knowledge of English to answer questions, assured the writer that the Sunday morning train for Calais would depart and that trunks would be taken. This in spite of the fact that the trunks already awaiting transit were

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piled one on another until the uppermost touched the ceiling. However, one was glad of an official excuse to tell his women folk "we need not start to-night."

Sunday morning dawned beautifully bright and moderately quiet. save for the occasional shrieks of *"Pour Patrie! Pour Patrie!"* of some passing band on the way to barracks. The hotel people declared that "The Calais Dover boat would not go!" that "the Calais train would not go!" and that in no event would trunks be accepted. This at 7:30 A. M. We boarded our buss, trunks atop, and started for the station, in spite of these announcements. Only one of their statements was true. To our amazement the station was almost deserted. Such a transformation in a few hours seemed impossible. Only one gate was open, and that was controlled by military guards. And no one was allowed to pass who had not previously purchased a ticket. By showing tickets in a bunch. so that they could not readily be counted, Dr. Edwin Darby was smuggled past the guards. Trunks, however, were not permitted. Imagine our feelings at leaving all our luggage on the hired bus, hoping that they might be returned to the hotel.

After that, all was easy. The train was not more than two-thirds filled. We traveled in comfort. The Dover boat took us across, despite the hotel men's prophecy, and we had afternoon tea in a Pullman traveling from Dover to London.

A few, however, who had not procured tickets for Sunday, fared less satisfactory. Some did not reach London for ten days, and some went home in the steerage on French liners. But they will tell their own stories at dental meetings this winter.

The opening and closing meetings of the Congress have been described elsewhere in this issue. Of the Section meetings there is little to be said. There were not enough dentists in London to furnish even fair-sized audiences for ten different sections. Everywhere men expressed sympathy for the English officers and committeemen. They had evidently worked so hard and deserved so much more than could be attained in the circumstances. Yet in some sections the audiences made up in quality and interest for what was lacking in numbers.

The great exhibition of dental goods was beautifully arranged, and in itself resembled a World's Fair. Yet the exhibitors and their clerks

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outnumbered the visitors to such an extent that one wondered how much they would all lose.

In the open air, near this building, a really good table d'hote luncheon was served daily.

Most of the projected social functions were necessarily abandoned. The reception by the Lord Mayor and Corporation of London at Guildhall occurred on Tuesday night as scheduled and was a notable affair. Many Americans, however, absented themselves because their evening suits were in their trunks in Paris. There was also a reception by the President and Council of the Royal College of Surgeons of England at the College, Lincoln's Inn Fields, on Wednesday, and here a very pleasant and instructive hour was passed in the marvelous museum in which is stored the great Hunter Collection. That one man in a single lifetime could have done so much and have amassed so many specimens of extraordinary interest passes comprehension. Four or five specimens of teeth implanted in the combs of cocks are still in a splendid state of preservation, and perhaps attracted more notice than any other one exhibit. Yet the examples of anomalies in dentition and of individual teeth filled several large cases, and men crowded about them till the end of the reception. All other social affairs, with few exceptions, were abandoned and the Congress was terminated on Thursday, the last Section paper being read at about 1 P. M. on that day, after which followed the formal closing meeting.

In concluding this rather sad account of what had promised to be and should have been one of the greatest events in dental history, one cannot but remark upon the very dignified and courteous manner in which the Sections were conducted. Too much praise cannot be bestowed upon the various presiding officers who held men within the rules established for the Congress, and yet accomplished this without the slightest suggestion of offense.

After the smoke and grime of battle shall have passed, if England still shall wish it, may her prayer be granted, and may the Sixth International Dental Congress be continued in London.

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I AM DISAPPOINTED. Really I thought when I started for Europe that I would return just loaded up with "table talk." Fact is I had hardly set foot in France, before all Europe began declaring war. France was courteous enough to give us twenty-four hours' notice to quit the country. Personally I managed to make it in twenty, and reached London in time for the International Dental Congress. But just as soon as I read my own paper, they closed the Congress. Cause and effect, I suppose.

THUS I HAD VERY few opportunities to sit quietly with confreres and discuss dental topics. Of course, I met a few men, as for example on the boat going over, but the most important subject with them all seemed to be the question: "If it gets rougher, and the ship starts rolling, would it be advisable to take Mothersills?" In Paris it was just as bad. In the open air café at the Continental, the talk was all about whether there would or would not be war. At the Moulin Rouge one was asked: "Did you ever see the like?" At the beautiful dinner at Armenonville where the ladies dined with us, the comment was: "Why don't we do this in America." In London it was no better. Whether in the Lounge at the Savoy, in the Lobby of the Cecil, at luncheon at the Ritz, dining at the Piccadilly, or discussing one of those wonderful joints at Simpson's, only two topics were discussed. "Have you recovered your luggage?" and "Do you think we will be obliged to go home in the steerage." Occasionally a man said a word or two about Uncle Sam sending transports, but no one went into transports at the prospect.

SO ALL THE WAY back, when I was not leaning over the rail looking for a German cruiser, or peering through the fogs, or gazing at the beautiful iceberg which passed us coldly by, I was wondering whether the boys would meet me at the boat with a band, rush me off to a Grill or a Roof Garden and talk shop long enough for me to pick up a few stray bits to chat about. But sad is my lot! They have heard about the war

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over here, and all I can get out of folks is: "The Kaiser did!" or "The Kaiser didn't!" or, "Will the Kaiser?" or "Won't he?"

IN THIS PREDICAMENT I grabbed up half a peck of letters that had arrived during my absence, and went up to a quiet spot in Central Park, far, far from the telephone's tinkle or the newsboy's sonorous song. And lo! in the lot I found three letters which fit together singularly well. They are so totally different.

BEFORE WE GO any further let me distinctly declare that I am not here inaugurating any attempt to publish talks on business management. The aim of "Items of Interest" is to tell you how to do your work, not how much to charge for it, nor how to collect your bills. Nevertheless we may turn aside from the regular rut for just once in response to the following appeal.

IN ONE OF THE letters I find the following from a good friend of mine, a gentleman in Kentucky. He says: "Will you give me your frank opinion on the following: Is it not true that he who can profit by the experiences of others, is the man who succeeds the fastest? Take away the avenues of learning after graduation, and what progress would be made by the individual? We have had some articles on office management, efficiency, and business talks. But what has been printed on various means of establishing a practice? Why withhold such knowledge from the worthy young man, and leave him by bitter experience to get through and around the pitfalls that he is sure to encounter? Your "Around the Table" is a good department. Why could you not give us in it a talk on practice building. You need not recite personal histories, but perhaps you could weave a story based on the experiences of prominent and successful men. I have made bitter mistakes myself, but by questioning others I have obtained many good ideas. Yet there is much that I would like to know. Does dental literature give me and others like me any enlightenment?"

I HAVE PRINTED the above appeal in full, because of my reluctance to launch this magazine into any campaign of business talks, and thus it will be understood that I turn aside from this fixed policy only because at the moment it seems to me that the claim of my Kentucky friend is just. It is true that the young man is left altogether too much to his own resources in gaining a foothold in professional success. Considering the selfish indifference of the majority, what wonder that these young feet slip at times and that they wander into paths unprofessional but more immediately remunerative!

THEREFORE I will cheerfully accede to the request of my Kentucky friend, especially as I believe that I can give some hints that may prove of use. It happens that some ten years ago I gave such a talk to the Alumni and graduating class of the University of Buffalo. A month ago in Paris I was invited to take luncheon with an American dentist, in his truly sumptuous offices, on a fashionable boulevard. He showed me over

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this place, reminding me of the above mentioned lecture; he recalled that he had accompanied me to my hotel after the meeting for a further talk on the same subject and then, waving his hands about his rooms, he said: "Doctor, I owe all this, all my success to you; to the advice that you gave me that night!"

THIS, OF COURSE, IS not true. No man owes success in life to anyone but himself, except in a purely subjective way. Yet it is true as my Kentucky friend says that, "he who can profit by the experience of others, is the man who succeeds the fastest!" And the one or two bits of advice which I can give have been proven of value by myself and numerous others besides the gentleman in Paris.

BUT FIRST LET me reproduce, at least, in part the two other letters to which I have alluded. The first, because it seems to point out some of the pitfalls that are difficult to avoid; the second, because the writer most adroitly gives us a pen picture of many of the humans that we must serve.

THE FIRST LETTER is signed "James Ernest," and is postmarked in Connecticut. That is not the gentleman's real name, but James is certainly in earnest, and evidently has had some experiences which will be familiar to many, and may well be seriously studied by those just starting out. Therefore peruse, digest and profit by what James Ernest tells us.

"WHAT ARE YOUR feelings when you visit a cemetery? You are sad, rather than mad, are you not? Have you a cemetery in your office? No? Lucky man! Or liar perhaps! Anyway, I have one in mine, and every time I bury a dead-beat I am Sexton, Minister and Mourner, all in one. Chiefly Mourner. I just hate these funereal functions, and I am tired of reading such epitaphs as 'Sacred to the Memory of Profit and Loss!'

"BUT WHAT CAN WE DO? Where find a remedy? Yet there should be one. If a bricklayer were refused payment for the last hour of a day's work, he would hurl aside his trowel and precipitate a strike which would tie up the whole works. I hope I am as professional as my neighbor, yet even the preacher receives his stipend for his preachments. There was a time when I could proudly boast that there were no bad accounts on my books, but alas, that day has past, I fear, like the bloom of youth, never to return. My but that was a grand old time! Just out of school, and needed the money! Hence the rule: "Cash at every sitting," and patient and dentist both satisfied. Then stalked into my office that beguiling gentleman, Mr. Credit, and soon thereafter occurred the first interment in my business graveyard. Friend, will you saunter with me under the weeping-willows and let me recite to you the brief histories of a few of my buried dead?

"OBSERVE THIS tiny headstone? Only a small grave this one. The bill rendered was for five dollars, and the date of service two years back.

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❖ The young Miss, a daughter of a retired physician, called with the bill ❖ in one hand and two-fifty in the other, and placidly informed me that ❖ her 'mother said that was quite enough to pay for what had been done.' ❖ Neat, wasn't it? Quite simple, too, and can be utilized by almost any ❖ young person.

"THIS BLACK STONE marks the resting place of a young man, a stranger ❖ who paid me two visits and received a gold crown. Nothing was said about ❖ payment until the crown was firmly cemented in place, when he informed ❖ me that he had brought no money with him as he had not expected me ❖ to finish that day. Shades of Blackstone, what can a busy dentist do ❖ with a case like that? What did I do? Well, by the end of a year I ❖ collected all but one dollar, less twenty per cent. to a collector. By the ❖ way that bill collector is a sort of silent partner of mine, and he earns ❖ his commissions at that.

"A NEAT VARIATION of the above is a promise to pay as soon as the ❖ work is completed. Can you ask a lady to do more? When the bridge ❖ is set beyond removal, the lady discovers that she left her pocketbook ❖ at home on the piano. This trick is usually a complete success. At ❖ least, I have a whole row of such 'remains' in my cemetery.

"THERE WAS ONE WOMAN, a champion in her class. Talk about theft ❖ from the person? This was like grabbing a man's purse on the highway ❖ and telling him to wait; that you are just going to the corner grocery ❖ to get some change and will be right back. This feminine hold-up per- ❖ son was of regal manner; perfectly ladylike and carried things off in the ❖ 'James! Call the carriage' style. She was a casual patient, that is with- ❖ out appointment. Had a cleansing and several fillings. Then asked for ❖ my bill, expressed satisfaction, and pleasantly informed me that she ❖ would step over to the bank and get some money. Why! I thought she ❖ must be the banker's wife! But later I learned that the banker was a ❖ bachelor.

"THIS MONUMENT was erected to the memory of a lady of moderate ❖ means who owes two dollars balance, but refuses to pay because a friend ❖ declared that I had overcharged her. Next to her, is a woman who owes ❖ four dollars for a filling done for her daughter. Declines to settle be- ❖ cause she had told the girl not to have the work done. This grave with ❖ the For-get-me-nots growing on it, recalls a case of unfinished treat- ❖ ment for a daughter of a physician. The doctor wrote that being ❖ a medical man, if his daughter needed 'treatment' he would do it him- ❖ self, and I need only concern myself with fillings.

"IN THIS VAULT I place uncollected accounts against men whose wives ❖ supply and handle the cash. This genus homo dresses well, is the most ❖ friendly, sociable cuss imaginable; wants his mouth put in perfect order, ❖ regardless of time or expense, and then blandly tells you to send the ❖ bill to 'wee wifey.' In the first experience of this sort, 'wee wifey' called

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and proved to be a thorough business woman. For a discount of thirty-three per cent. she would settle. Why argue with a lady? I settled.

"JESTING ASIDE, why should we not receive full fees for what we earn? Some of you will laugh and say: 'If he had a practice like mine, he would not be bothered with bad accounts.' It is well enough for those who are practicing in ideal environments to talk thus, but the average dentist works under poor conditions, and gets low prices for his work. He also must cater to people who try to save money on dental bills just as they do when buying food or clothes. It is an ideal proposition, of course, to have patients who permit you to do what you please, charge what you please, and who send a check on receipt of bill. But how many of us have patients like that, and to those who have not, what is the best solution of the problem of receiving a fair return for services rendered?"

HERE ENDETH the recitation of woes by James Ernest, and in conclusion he asks a question the answer to which would be helpful to many especially to beginners. But let us leave that for the present, and cross from Connecticut to Massachusetts to learn whether experiences differ much in these adjacent territories. The following is contributed by Dr. Horace F. Gleason, of Malden, who informs me that he has had thirty years of experience. He declares that he wishes to offer "A few Don'ts for our younger brothers, and as a gentle reminder to older ones." Here they are.

"DON'T BE LATER than 7.30 A. M. in reaching your office, nor leave before 9 P. M. Remember you are there solely to serve your fellowmen and women. Someone may have an ache, between these hours, and may need you.

"DON'T GET PEEVISH if you wait till eight o'clock at night to extract some teeth for Mr. Jones, and he fails to bring any money with him. It is your part to do good, and his part to do you, if he can.

"DON'T BE SURPRISED if Miss Araminta Brown advises her friends not to patronize you because you smoke. And try to forget that when you worked for her, her breath reminded you of a last year's 'fresh egg.'

"DON'T CHARGE more than three dollars for a porcelain crown, nor more than five for a gold one, and include 'treatment and filling of roots.' Your patients can tell you of many 'first-class dentists' who charge no more. Anyway, they need the money for other things.

"DON'T OBJECT if Sallie Smith makes four separate appointments and fails to keep them. No doubt she 'had company,' or 'Jack came to take her for a ride.' She will surely explain it to you when she makes her sixth appointment.

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"DON'T REFUSE TO WORK all day on Sunday. People can't be expected to lose any time from their own business just to accommodate you. So you must cheerfully work for Jews on Sunday mornings, and for Christians in the afternoon, because the latter must attend Divine Services in the mornings. If Sunday should prove to be sunny they may all go automibiling, both Jews and Gentiles. Well! Never mind! That will enable you to read your Sunday paper.

"DON'T BE ANGRY if some one makes a contract with you for forty dollars for work well worth sixty, and after three years refuses to pay the last ten dollars because 'one of your fillings did not stay.' Use better cement next time.

"DON'T WORRY YOUR PATIENTS about their bills until their accounts are over three years old. If you do, you may lose their custom.

"DON'T MIND IF some important patient, for whom you have done careful and conscientious work goes to a 'brother' dentist, because 'your work was not up to standard.' Doubtless your 'professional brother' has waited a year or more for an opportunity to explain how poor your fillings are and how much better and newer his method is.

"DON'T TAKE A VACATION, or if you do, don't be gone over a week, because Mrs. Henrietta Julia Brown-Sequard will almost surely call while you are away, despite the fact that you gave her a month's notice of your intended absence.

"DON'T REFUSE to repair without charge the plate you made for Mr. Thompson last year, and which he returns with the six front teeth off, explaining that he was only eating soft bread. Bread is the staff of life, and you can't expect your patients to live on soup just because your plates are weak.

"IN SHORT, DON'T bother about your own health or cater to your own comforts. You are a professional man, a public benefactor, and should be glad you are alive and enjoying the opportunity to do a few trifling services for your fellowmen. Thus live your life and when you die and your friends 'chip in' for the funeral expenses, no doubt the local paper will mention your passing, and allude to your few virtues, at the same time noting that 'the widow and her three children have gone to her father's home.' Verily! Verily, blessed are the meek, for they shall inherit the (six feet of) Earth! Ah-men!"

THE COMMUNICATIONS of these gentlemen have proven to be so interesting that I have been unable to curtail them sufficiently to leave room for my promised reply to my Kentucky friend. I had hoped to conclude this chat, but shall be obliged to resume the discussion next month.

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National Society Meetings.

AMERICAN INSTITUTE OF DENTAL TEACHERS, Ann Arbor, Mich., January 28-30, 1915.

Secretary, Dr. J. F. Biddle, 517 Arch St., N. S., Pittsburgh, Pa.

PANAMA-PACIFIC DENTAL CONGRESS, San Francisco, Cal., 1915.

Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

State Society Meetings.

OHIO STATE DENTAL SOCIETY, Columbus, O., December 1-3, 1914

Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

Those Wishing to Register in Indiana Please Notice.

In compliance with Section 9, an Act to regulate the practice of dentistry in the State of Indiana, approved March 8th, 1913.

On or before the 31st day of December of each year each dentist now licensed or subsequently licensed to practice dentistry in this State shall transmit to the Secretary of the State Board of Dental Examiners his signature and address, together with the fee of one dollar and the number of his or her registration certificate, and receive therefor a renewal license certificate. Said renewal license certificate shall be at all times properly displayed in the office of the one who is named in the license, and no person shall be deemed in legal practice who does not possess such renewal certificate. Any license granted by said board shall be cancelled and annulled if the holder thereof fails to secure the renewal

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certificate herein provided for within a period of three months after December 31st of each year; *Provided,* That any license thus cancelled may be restored by the board upon the payment of a fee of five dollars, if paid within one year after such cancellation.

Notices will be mailed to all dentists registered in Indiana to their last known address, on or before December 31, 1914. Failure to receive such notice will not be an exemption or an excuse for non-payment. In such cases all persons should notify the Secretary, giving their correct address. This also applies to all those living outside the State.

Respectfully,

FRED J. PROW, Secretary.

Bloomington, Indiana.

Michigan Licentiates Please Note.

The licenses of all Michigan licentiates, whether practicing in the State or not, who have not paid their annual registration fee, will be revoked at the next regular meeting of the board, which will be held in Ann Arbor, November 9th to 14th.

F. E. SHARP, Secretary.

Port Huron, Mich.

Michigan Board Meeting.

The semi-annual meeting of the Michigan State Board of Dental Examiners will be held in the Dental College at Ann Arbor, commencing Monday, November 9th, and continuing through the 14th. For full particulars and application blanks address

F. E. SHARP, Secretary.

Port Huron, Mich.

Ohio State Dental Society.

The Forty-ninth Annual Meeting of the Ohio State Dental Society will convene in Columbus on Tuesday, December 1st, continuing through Wednesday and Thursday.

Papers on live subjects by able men on Tuesday and Wednesday afternoon; clinics, Wednesday and Thursday afternoons.

The program is not sufficiently perfected to announce at this time, but a strong program and big meeting are assured.

The entire State is now organized into components and a very large attendance is anticipated.

F. R. CHAPMAN, Secretary.

305 Schultz Bldg., Columbus, Ohio.

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Montana State Board of Dental Examiners.

The Montana State Board of Examiners will hold a session on the second Monday in January, 1915.

DR. G. A. CHEVIGNY, Secretary.

Butte, Montana.

Maryland Board of Dental Examiners.

The Maryland Board of Dental Examiners will meet for examination of Candidates for certificates November 5th and 6th, 1914, at the Baltimore College of Dental Surgery, Baltimore, at 9 A. M.

For application blanks and further information apply to

F. F. DREW, Secretary.

701 N. Howard St., Baltimore, Md.

Rhode Island State Board of Registration in Dentistry.

The next meeting of the Rhode Island State Board of Registration in Dentistry for the examination of candidates will take place at the State House, Providence, R. I., Wednesday, Thursday and Friday, the 7th, 8th and 9th of October.

WM. B. ROGERS, D.M.D., Secretary.

171 Westminster St., Providence, R. I.

Indiana State Board of Dental Examiners.

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, commencing Monday, November 6th, and continuing five days. For application blanks and full particulars address

DR. FRED W. PROW, Secretary.

Bloomington, Indiana.

Wisconsin State Board of Dental Examiners.

The Wisconsin State Board of Dental Examiners will convene in Milwaukee at Marquette University on December 14, 1914, at 10 A. M., for examination of applicants to practice in Wisconsin.

High school diploma, application and $25 fee to be filed with the secretary ten days prior to above date.

Dental diploma to be presented in advance of the examination.

Junior dental students presenting a clear card for two years' unconditioned work from a reputable dental college and filing a high school diploma, or its full equivalent, will be permitted to participate in the

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theory examination in the following six major subjects: Anatomy, physiology, histology, chemistry, bacteriology, materia medica.

The grades made in these subjects will be credited at subsequent examinations.

Special application blanks for this examination and $10 fee, together with high school credits, to be filed ten days in advance.

S. H. CHASE, President.

W. T. HARDY, Secretary.

1404 Majestic Bldg., Milwaukee, Wis.

Virginia State Board of Dental Examiners.

The Virginia State Board of Dental Examiners will meet for the examinations of applicants to practice dentistry in Virginia, in the city of Richmond, Va., October 6, 1914, 9 A. M.

For further particulars address

DR. J. P. STIFF, Secretary.

Fredericksburg, Va.

Wisconsin State Dental Society.

At the last meeting of the Wisconsin State Dental Society the following officers were elected:

President, Dr. Wm. Hopkinson, Milwaukee; Treasurer, Dr. A. Gropper, Milwaukee; Secretary, Dr. O. G. Krause, 1209 Wells Bldg., Milwaukee.

The next meeting will be held at Oconomowoc, July 13-14-15, 1915.

O. G. KRAUSE, Secretary.

Massachusetts Board of Registration in Dentistry.

A meeting of the Massachusetts Board of Registry in Dentistry, for the examination of candidates, will be held in Boston, Mass., October 21-22-23, 1914.

Candidates who have applied for examination will report to the Secretary, Wednesday, October 21st, at 10 o'clock A. M., at Tufts College Dental Infirmary, Huntington Avenue, prepared with patient, rubber-dam, gold, plastic filling materials and instruments, to demonstrate their skill in operative dentistry. The Board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridgework, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology,

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bacteriology, anesthesia, chemistry and metallurgy, and will be held at Civil Service Room, No. 15 State House, commencing Thursday, October 22d, at 10 o'clock A. M. Candidates are required to bring pens.

All applications, together with the fee of twenty dollars, if first examination, must be filed with the Secretary of the Board ten days before the date of examination, as no application for this meeting will be received after that date.

Candidates for second and subsequent examinations will be required to fill out an application blank (Form 2) and forward to the Secretary.

Every candidate for examination must be twenty-one years of age.

Application blanks may be obtained from the Secretary.

Applications must be made out in candidate's own handwriting.

Temporary licenses are never granted.

The fee for third and subsequent examinations is $5.00.

G. E. MITCHELL, D.D.S., Secretary.

14 Water Street, Haverhill, Mass.

Northeastern Dental Association.

A meeting of the Northeastern Dental Association is to be held in the Hotel Somerset, Boston, Mass., October 15, 16 and 17, 1914. The officers and committee are doing their best to have a rousing good meeting. Please remember the dates and attend.

DR. O. KINSMAN, President.

DR. CHAS. F. KREPPEL, Secretary,
10 Hyde Park Ave., Milton's Block, Forest Hills, Mass.

Federation Dentaire Internationale.

At the annual meeting of the International Dental Federation, London, England, August 6, 1914, the following officers were elected for 1914-15:

Hon. President—W. B. Patterson, London.

President—Truman W. Brophy, Chicago.

Vice-Presidents—Harvey J. Burkhart, Batavia, N. Y.; F. Schaeffer-Stuckert, Frankfort-on-Main; M. Roy, Paris; W. Guy, Edinburgh; Rudolph Weiser, Vienna; Vincenzo Guerini, Naples; J. Howard Mummery, London; N. Etchepareborda, Buenos Ayres; Ernst Jessen, Strassburg.

Secretary-General—Florestan Aguilar, Madrid.

Assistant Secretaries—Burton Lee Thorpe, St. Louis; C. Van der Hoeven, The Hague; G. Villain, Paris; B. Landete, Madrid.

Treasurer—Edmond Rosenthal, Brussels.

Next place of meeting, San Francisco, August 30, 1915.

BURTON LEE THORPE, Asst. Sec'y.

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Union Meeting of the Fifth, Sixth, Seventh and Eighth District Dental Societies.

A union meeting of the Fifth, Sixth, Seventh and Eighth District Dental Societies, State of New York, will be held at the Hotel Iroquois, Buffalo, N. Y., November 19th, 20th and 21st, 1914.

J. PORTER MALLORY,
Chairman of Local Committee.

463 W. Ferry St., Buffalo, N. Y.

Alumni Association of the College of Dentistry, State University of Iowa.

The Tenth Annual Alumni Clinic of the State University of Iowa College of Dentistry will be held at Iowa City October 22-23-24, 1914. On October 24th the University will have its annual home-coming with the Iowa-Minnesota football game in the afternoon. This, combined with our exceptional program, should make the attendance unusually large at this clinic.

DR. JOHN VOSS, Secretary.

Iowa City, Ia.

The Connecticut State Dental Commission.

The Connecticut State Dental Commission hereby gives notice that it will meet at Hartford November 19-20-21, 1914, to examine applicants for license to practice dentistry in this State, and to transact any other business proper to come before it.

Application blanks, copies of the revised requirements, rules, etc., will be mailed by the Recorder upon request.

EDWARD EBERLE, Recorder.

902 Main St., Hartford, Conn.

George Edwin Hunt.

The following resolution was adopted by the Wisconsin State Dental Society at its meeting in Fond du Lac, July 16, 1914:

"*Whereas,* Almighty God in His infinite wisdom has seen fit to remove from the scene of his earthly labors, Dr. George Edwin Hunt, M.D., D.D.S.; and

"*Whereas,* The Wisconsin State Dental Society desires to record its appreciations of him as a man and its sense of sorrow at his death;

"*Therefore, Be it Resolved,* That the Wisconsin State Dental Society extends to the family of the deceased their sincere sympathy in their bereavements, and that this resolution be spread upon its minutes and a copy be sent to the family and to professional journals for publication."

Committee: W. F. FAUST,
CHAS. L. BABCOCK,
F. A. HEILFUSS.

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Radiography a Very Important Factor in Dental Progress.

By WILLIAM A. GIFFEN, D.D.S., Detroit Mich.

Mediocre ability developed and well trained will produce greater efficiency than will extraordinary ability scattered or uncared for. It is what we do with what we have, as much as what we have that counts in dentistry. Efficiency in our case, whether we possess great or little ability consists of making the best of what we have, of doing our best with it, of reaching the highest within the range of our capability. We can do no more, we should do no less.

Efficiency.

Average efficiency in results of dental operations is much lower than it should be, because so many dentists are satisfied with average results. There is no department in dentistry where this low average has been demonstrated so thoroughly, as in root canal treatment, by the excellent work of Drs. M. L. Rhein, D. M. Graham, R. Ottolengui and other radiographers. In fact, the more progressive members of the dental profession have acepted the evidence to date that the rational use of the X-ray as an aid to the early diagnosis of dental lesions, is invaluable to the humanitarian dentist, and those members who do not realize the value of the radiograph in their practices are not properly protecting their professional reputations, and are apt to be embarrassed when treating conditions that do not respond readily by having the patient say, "Doctor, don't you think it would be a good thing to have a radiograph

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made to find out what the conditions are regarding this case?" Even if they have not consulted other dentists there is always some friend among the laity who is liable to give the patient this advice.

Interpretation Important.

A correct interpretation of radiographs is the most important point in this work, but like cavity preparation or any other dental work, there is but one way of becomnig an expert and that is by practical experience, and the beginning is bound to make mistakes. However, like spoiling an inlay those mistakes should not discourage the dentist, but spur him on to more accurate effort.

Dr. Johnson's Editorial.

It seems to the writer that it is a great pity, at a time when the profession is making such heroic efforts to improve the technic of root canal work, that a man of the reputation and influence of Dr. C. N. Johnson should see fit to write an editorial throwing so much discredit on dental radiography as that which was published in the April number of the *Dental Review*, and which was so charitably criticised by Dr. R. Ottolengui in the June number of the ITEMS OF INTEREST. It is to be hoped that every dentist who read Dr. Johnson's editorial will read Dr. Ottolengui's comments on the same.

In arriving at a diagnosis of a dental lesion with the aid of the X-ray, the dentist should always get all details of the clinical history of the case, and know the angle from which the ray was directed; otherwise the diagnostician may occasionally be misled and disappointed.

Infection.

In making dental examinations, it is astonishing to find so many devitalized teeth which have incipient or blind abscesses due in many cases to inefficient treatment. Many of these teeth may never have been sore, nor have caused trouble in any way, even when there has been considerable resorption of osseous tissue in the region of the apices; undoubtedly due to toxic irritation. However, when the opsonic index of those persons becomes subnormal and physiological resistance of the tissues becomes lowered those cases will undoubtedly cause trouble.

It has been estimated that twenty-five per cent. of the people have infected areas around the ends of the roots of some of their teeth. These septic foci either complicate or produce a great variety of infectious conditions which, undoubtedly, shorten many human lives, and it is our duty to correct these conditions when we find them, as there can be no excuse for leaving any focus of infection anywhere in the mouth provided we know where it is. As a result of the X-ray of the profession will be spurred on to do far better work, and the percentage of pathologic lesions will be much decreased. Dentists in the future must

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take advantage of the Roentgen ray to examine abutments for crowns and bridges, and it will enable them to use only those which can be put in condition to withstand the stress of mastication, with the result that the percentage of chronic lame teeth under crowns and bridges will be much decreased.

It will enable the dentist to make an early diagnosis of pathologic conditions which already exist, and which he may be called upon to relieve, with the result that the period of suffering by the patient will be lessened from years, months, and weeks to days, hours and minutes.

Filling Material. The radiographic examination of root fillings would be made much more simple and accurate, especially in those cases where clinical symptoms and history are absent, if some investigator would devise a root filling which would meet the requirements demanded by the profession, and in which would be incorporated a sufficient amount of a neutral material impervious to the ray. One could then prove absolutely whether the apical third of a root canal were filled with the filling material or with hot air.

Protection. It is a fact that fifteen operators have sacrificed their lives in this country alone and many operators and patients have been maimed and disfigured by the X-ray. Thus, every dentist who decides to take up this work in the future, should fully protect himself and his patient from the dangerous effects of long or repeated exposure to the rays.

Treatment of Pyorrhea Alveolaris.

By A. C. Strickland, D.D.S., Houston, Texas.

I have been very much interested in the articles under the heading of "Correspondence" on "The Surgical Treatment of Pyorrhea," in recent numbers of Items of Interest, by Drs. Heckert, Stewart, Simon, Morton, Burns and Norton. For the last several years I have treated certain cases of this disease along these same lines, splitting the gum tissue to the bottom of the pyorrhea pocket, removing all deposits and cauterizing the parts well with nitrate of silver and later polishing the exposed surface of the roots thoroughly. This treatment has worked well in some cases of single-rooted teeth and in cases where the pyorrhea pocket was on the labial or buccal surface of the roots, but in cases of multi-rooted teeth and where the pyorrhea pocket was on the lingual or palatal aspect of the root, this method has not proven so successful with me; nor does this class of treatment raise the immunity of the system

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nor eradicate the disease from the blood and, while we may produce a cure of the diseased tooth by this treatment, it is almost certain to recur in a very short while by attacking some of the other teeth in the mouth and often in a part remote from that first attack.

In treating pyorrhea we have many things to consider. There are several varieties of this disease, and to treat it successfully and intelligently we must be able to correctly diagnosticate the variety we have under consideration for treatment and to find the etiology of this particular case. This would often require an analysis of the urine and a laboratory test for the bacteriological findings. The patient's diet also must be considered and, if found at fault, should be corrected. Thorough instrumentation, prophylaxis and a constitutional treatment to raise the general tone of the system and the intelligent use of autogenous bacterial vaccines to immunize the parts and ward off further attacks will be found the most sane and successful treatment for pyorrhea, so far as our knowledge of the etiological factor of this diseased condition is what it is and has been proven up to the present time.

Formaldehyde, a Cure for Pyorrhea Alveolaris.

By G. A. Barnett, D.D.S., Joplin, Md.

After two years of experimenting I have found that a solution of formaldehyde will positively cure pyorrhea in its worst form. You will get almost instant relief where pain is intense, pus will stop flowing within a few days, gums will settle down around necks of teeth, and if the alveolar plate is not entirely destroyed teeth will soon tighten so that if there are any missing teeth they can be replaced with bridgework in a surprisingly short time.

Unlike Dr. Friedman I will give my chosen profession the benefit of my experience in the treatment of the tubercular condition of the alveoli.

I will report on only one case at this time, though I could give dozens of others but I consider this particular case as bad as any could be.

Case No. 11, J. S. W., age about 50, came to me one year ago after having been treated for pyorrhea for a number of years. The six lower anterior teeth were barred together with a cast plate; his gums were greatly inflamed and there was an excessive exudation of purulent matter from the pockets, and the patient had not slept for two nights.

I removed what calcareous deposit there was around the necks of

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the teeth and prescribed ten drops of formaldehyde to half a glass of water, and ordered that if he did not get a slight burning sensation around necks of teeth and under the tongue to keep adding formaldehyde until he did. He was obliged to use from twenty to twenty-five drops to half a glass of water to get the slight burning sensation which is imperative.

I see this case every sixty days for prophylactic treatment. There are no signs of pus, gums are hard and teeth are tight. Do not let the "wise ones" think they can put up a preparation of disguised formaldehyde and sell it as a "cure of pyorrhea." It is necessary to have each individual test out the amount that his or her gums will endure to get the burning effect.

I usually start them with eight or ten drops to half glass of water and instruct patient to add to or deduct as necessary. I have one patient who can only use six drops.

A little later I will give what I have found to be the principal cause of pyorrhea.

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President's Address.

American Society of Orthodontists.

By Guy G. Hume, D.D.S., Toronto, Canada.

Mr. Vice-President and Members of The American Society of Orthodontists:

As this is the first time the American society has held its meeting outside the borders of the United States we, as Canadians, wish to express to the members of the society our appreciation of the honor done us in holding the meeting this year in Toronto, and we trust the members will enjoy their stay while in the city. Personally, I wish to thank the members for electing me to the office of president.

It is not my purpose to burden you with a lengthy address, but simply to call your attention to one or two features relating to our association. First of which is the time of holding our annual meeting. The time should, I think, be changed on account of the danger of encountering intense heat during the month of July. We should not be subjected to the inconvenience of traveling under such conditions, nor do I think we should be influenced by other associations in choosing our dates of meeting. For the last two years the dates of our meeting have been selected and subsequently changed on account of conflicting with dates of other societies. As they changed their dates this year, we had to change ours to conform to the resolution passed at our last meeting, thus necessitating our meeting on the United States national holiday, July 4th. Some members wished to have the dates again changed this year, but a vote of the Executive Committee decided that we should ad-

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here to our resolution passed at the last annual meeting. We are an independent organization and we should meet irrespective of other societies. Our object is to work and get the most out of our association with one another. This meeting should not be just the beginning of a holiday. In future when the place of meeting is chosen, I think the time most suitable for that locality should be decided.

As to our membership, we find that the society is in a very healthy condition. Although three members handed in their resignations last year, we find a goodly number making application for membership. The fact that our constitution now calls for a more rigid examination of new members, eliminates any possibility of individuals being elected to whom any objection could be taken. We do not aim at numerical strength, but each member should endeavor to bring into the society individuals who would be eligible for membership. This society always extends an invitation and grants the full privileges of its meetings to any and all who are interested in the study of our particular specialty.

Our society is to be congratulated on having such an excellent program as has been prepared for us—one of the features is the large number of "Cases To Be Reported." We trust those taking part in this section of the program have kept in mind the suggestion as to "failures." We all want to hear of the other fellow's failures. If we recognize wherein we fail we will probably learn more than from our successes. The best results of a meeting, however, must depend on the combined individual efforts of all the members to take part in the discussions of the papers presented and not leave it just to a few.

Research Work.

Few of us are endowed with the faculty of carrying on such work as has been done by Dr. Dewey—but such work must be recognized as being of the highest scientific order, and is greatly to be commended. We trust that Dr. Dewey will give us some report of the progress that he has made since last year, and enlighten us on any further information he has gained regarding "The Opening of the Intermaxillary Suture."

In reviewing the recent progress in our work—possibly the mechanical application of force stands foremost. The valuable paper given to us last year by Dr. J. Lowe Young, and the most exacting technique as demonstrated at that time by him, has probably interested more of the members of our society than any other phase of our work during the last year. This subject will no doubt receive its merited attention in its place on the program of this meeting.

Terminology.

A report which will be made at this meeting on "Terminology" should be thoroughly discussed by all. Different terminology is being used at the pres-

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ent time by various members of our society, and it is most desirable that all should conform to the use of the same terms, so that there will not be misunderstanding and confusion. In different scientific bodies we have from time to time suggestions as to the use of terms other than those which have probably been in vogue for some time, because the new terms are more expressive or more scientific. In reviewing the work of the Committee on Nomenclature of the Institute of Dental Teachers, we find no terms relating to our particular subject have been mentioned, so that when the committee which was appointed at the last meeting makes its report, the members of the society should give every consideration to the suggestions made therein. It is only by acceptance of new terms by societies such as ours that a change in terminology will be adopted by the profession. Individuals cannot do it. And in anticipation of the report to be made to this society, I would suggest that we co-operate with the Committee on Nomenclature of the Institute of Dental Teachers, and if new terms are adopted by this society, that we ask the Institute of Dental Teachers to add such terms in their Glossary. If we could arrange with the teachers in the different colleges to use new terms we adopt, there could be no better way for the furthering of our aims. This leads me further to say that this society should take some active interest in the education and training of those who study the subject in which we are most interested. In the majority of dental colleges this subject is not given sufficient time. I contend that all students in dentistry should have as thorough a course as possible. The demand for services is ever increasing and at the present time there is only one place of which I know that is giving a post-graduate course. I believe if our society would act the authorities of the schools could be made to realize that more time should be given to this subject in our dental colleges. This matter is of vital importance. I venture to suggest that our society go into the matter of dealing with post-graduate work so that graduates may have an opportunity to further their studies and be given the very best instruction. If it were possible, some place should be chosen where a continuous clinic could be carried on as it is most desirable that those studying should be given as much clinical work as possible. Could we not arrange a joint clinic along with other "post-graduate work" in dentistry, where there would be good hospital equipment and good clinical material associated with work in pathology and histology.

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Discussion of President's Address.

Dr. D. Willard Flint, Pittsburgh.

As our president has just said, to-day we are meeting in a foreign country. To many of us it is just like coming home. It may be a coincidence, but Dr. Rogers, of Boston, is a Canadian, and as two Canadians, Dr. Young and myself have been appointed to open this discussion, it seems to me it is pretty much all Canada for the first round. It is twenty-three years since I first met Dr. Hume on the football field, and to-day we meet again in the quest for knowledge; a different kind of game.

The first point the president brought up was as to the time of our meeting. This is a much debated question and always will be because we cannot suit every member, and there are good reasons why we are meeting here at the present time. I think there is a resolution with reference to next year's meeting place, so that we cannot discuss that part of the address. I believe by resolution the association has already decided to go to the Coast in the year 1915.

With regard to nomenclature, we have a good many old heads in our Association and it is pretty hard to get them to give up some of their pet terms because they have used them during their professional lives. and I imagine we will have a worse battle over terms than over anything in our society, because some people do not wish to yield in that respect.

Dr. J. Lowe Young, New York City.

Our president has called attention to the advisability of selecting a more suitable time for our meeting than the forepart of July and with this I most heartily agree and wish to amplify. We have but one meeting a year and it should be the object of every member to give and receive as much information on the subject of orthodontia and collateral branches as is possible, if we hope to keep pace with the rapid progress of our specialty. It is questionable if any of us are at our best at the beginning of our vacations; if we were we would not require a vacation.

Excessive hot weather is very depressing and we usually have a hot spell the forepart of July. Let us hope for cool weather during this meeting.

I am also very much opposed to this body changing its date of meeting so as not to conflict with the meeting of some other association, or to be just before or just after some other dental meeting. When a time of meeting is selected let that be final.

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Post-Graduate Work.

I do not agree with our president when he suggests that this society might engaged in post-graduate work. I am convinced that for graduates of dental colleges to be qualified to specialize in orthodontia, it is necessary that they should take a course of such length and such thoroughness in all its details that it will be impractical for this or any other society to give such a course. I trust that the time is not far distant when some dental department connected with one of our universities will take this matter in hand and establish a post-graduate course, and that it will be conducted on broad and scientific lines, and that there shall be a continuous clinic under the supervision of a competent orthodontist who will be paid salary enough so that he can give up his entire time to this clinic and to scientific research work. This course to be thorough should extend over a full college year, and a degree might be created and conferred on those qualified to specialize in orthodontia. It is rare indeed for a general practitioner to be found qualified to treat malocclusion, except of the simplest kind. I am a firm believer in specialization, and for this to continue we must have a place to properly prepare men or women to specialize.

Dr. B. E. Lischer, St. Louis.

I desire to discuss just one point in the president's address. I am very glad to note that he refers to the educational problems, and that our discussion of them this year is so in earnest. I wish to recall at his time that I referred to them last year, that I emphasized the fact that our specialty merits full university recognition. It seems that Dr Young agrees with me this morning on the subject of education. I believe this society ought to appoint a Committee on Education, which could co-operate with similar committees from other bodies, and thus mold the educational tendencies of the entire country—in so far as our specialty is concerned. It seems to me that we owe this to our specialty, to our society, to ourselves and to the young men who are to follow us.

Dr. C. A. Bawley, Washington, D. C.

I am heartily in accord with the recommendations in the president's address, but many of the points he raised are to be discussed at another time. For instance, we have a committee who are to present a report on nomenclature, and I presume from the personnel of the committee the report will be a complete one.

The time of our meeting is set for next year. So far as this time of meeting is concerned—that is, at this time of the year, I think that has been discussed from year to year pretty thoroughly, and it is impossible to set a time that suits everybody. If we set it for September or after vacation, we find the different members commence their work at

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different times; some the first of September and some the first of October, according to locality, and no one time is convenient to all. We have had some of our best meetings in the middle of the professional year, along about January. If the members of the association were not scattered over such a vast territory, I think that would be one of the best times we could possibly meet, but it means to many a trip of three or four days in length, and to meet at such time takes a great deal of valuable time. It seems to me this is really about the best time we can possibly meet; it is in the early part of July; our work is generally finished; it is the time of the meeting of the National Dental Association when many of us have to make a trip, and it is about as suitable a time as we can find.

The president's recommendations in regard to education, I think, are very *apropos*. The recommendation of this association to the colleges should have some weight and it should have a definite plan. I think the suggestion is a good one that we have a committee on education or a council, as it has been called, which can make suggestions when called for, and make a sort of recommendation as to what is desirable in an undergraduate school. If a degree is to be given, what is the plan or the course of study? I think a council would do very good work along that line.

Dr. Hume. As to this society taking up post-graduate work, my idea in suggesting it was to bring out the point alluded to by Dr. Lischer of having a committee appointed to thoroughly investigate and report upon post-graduate work. I do not know that our association, as an association, should adopt post-graduate work.

The other points have been discussed so thoroughly that I really can think of nothing further to say.

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Report of the Work Done by the Denver Oral Hygiene Committee

Prepared by HENRY F. HOFFMAN, D.D.S., Denver, Colorado.

Read before the Denver Dental Association, December 15, 1913.

The present members of the Denver Oral Hygiene Committee, in the order of their term of office, are: W. A. Brierley, Will P. Smedley, A. C. Hamm, H. F. Hoffman and R. A. Adams. H. W. LeFevre, H. A. Fynn and J. L. Howell are retired members.

We wish to take this opportunity to thank the profession in Denver for the generous moral and financial support which has been accorded to the committee, and we only hope that the profession feels as enthusiastic over the work as we do, for it is one of the great enterprises now taking tangible shape to lift our profession to the position to which we have so long aspired.

At about the time that the clinic work was planned it became the fixed object of the committee to have this work ultimately carried on as a part of the public school system, and the committee has since worked with that one object in view, being assisted materially by other members of the profession who were not members of the committee.

The free dental clinic, started in the West Side Neighborhood House, was opened for patients January 18, 1912, and operated for the balance of the school year, or approximately five months, after which it was moved to its present quarters at the Longfellow School, where it was operated for the entire school year of 1912 and 1913.

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DOE, JOHN

Date of Birth Nov. 25, 1898	*School* Annunciation	*Grade* 8th
Father's Name J. L.	*Occupation* Laborer	*Business Phone*
Mother's Name Margaret	*Residence* —— Marion St.	*Home Phone*
When Reported	*Investigation* True	
Previous Marriages		
Divorced	*Separated*	*No. Boys* / *No. Girls*
Religion	*Nationality*	
Wage John, $6.00 per week		*Rent* $10.00
Permit to Work Oct. 8, 2506	*Legal Notice*	

Remarks

Six children; two in school; three under age; father sick much of the time; only girl cripple; John learning trade with American Forge Co. Made two grades in Night School last year. Will attend Night School this year.

D. S. T. 4-13-2M 858

Fig. 1.

Clinic Taken Over by School Board.

Up to that time the expense was borne entirely by the dentists, but in the fall of 1913 the School Board undertook to bear the expense, appropriating $1,200 to carry the work on during the remainder of the school year. Under this arrangement the clinic was reopened about October 1, 1913, with the understanding that the Denver Dental Association, or its representatives, should have charge of the actual management, this latter part of the arrangement being made at the request of the School Board.

The decision of the School Board to take up the clinic was made purely because they were convinced that children suffering with bad teeth could not do good school work, and that to remedy these troubles

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BLANK, GERTRUDE

Date of Birth Dec. 25, 1898	*School* Adams Co.		*Grade* 8th
Father's Name John	*Occupation* Mother, laundress		*Business Phone*
Mother's Name Emilie	*Residence* 7550 Clayton St.		*Home Phone*
When Reported	*Investigation* True		
Previous Marriages			
Divorced	*Separated*	*No. Boys*	*No. Girls*
Religion	*Nationality*		
Wage Mother, $2.00 per day; Gertrude, $4.00 per week			*Rent* $8.00
Permit to Work Sep. 15, 2412	*Legal Notice*		
Remarks			

Seven children; four in school; one girl (16) ill; father nearly blind; mother washes every day. Gertrude is working at D. & F's.

Fig. 2.

would in the end be an actual financial saving to the district by reducing the number of pupils who fail in their school work.

Fig. 6 shows a view of the waiting room at the Longfellow School Clinic, and gives a fair idea of the way in which the clinic is patronized. Fig. 7 is a view of the operating room.

Method of Admitting Patients.

When the clinic was first started the chief difficulty encountered was in the method of admitting patients. The plan to have all patients come through the Attendance Department of the public school was finally adopted and has proved most satisfactory, and is in use at the present time with such slight improvements as experience has made necessary.

A brief explanation of this system will doubtless prove interesting to you as affording a better understanding of the methods employed

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DENTAL-CLINIC

Appointments for children at the Dental Clinic must be made through the Attendance Department.

Principals will send only those children whose parents cannot afford to pay even a small fee for the work.

The age of children treated at the Dental Clinic is limited to sixteen years.

Night school children under sixteen, have also clinic privileges as above.

The hours of the Dental Clinic are from 1:30 to 4:00 P. M.

Tooth brushes may be purchased at the Clinic for seven cents.

MARGARET T. TRUE,
Attendance Department.

Approved:

WILLIAM H. SMILEY, *Superintendent.*

DENVER, COLO. October 14, 1913.

Fig. 3.

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for referring patients to the public school dental clinic. The Attendance Department is the department of our public schools to which is delegated the enforcement of the compulsory educational law; in connection with which work it is necessary to examine into the various causes, contributing to delinquency as health and financial condition. Very complete records are kept of all the children in the schools, coming from families which are deserving of assistance. Figs. 1 and 2 are from the records of the Attendance Department, and are fair samples of the records which they have of these cases. Each of these cards is worthy of careful attention, as they give a better idea of the utter impossibility of these people paying for any kind of dental services, and it will not be hard for you to understand the great assistance such as a clinic is to these people.

Fig. 3 is a copy of the circular letter issued by the Attendance Department, giving instructions to the principals relative to referring patients to the clinic.

In a few instances pupils apply for dental services to the principal, but in most cases the teacher suspects something wrong and refers the pupil to the principal of the school. The principal telephones to the Attendance Department to ascertain whether or not the pupil is eligible for the free clinic.

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DENVER PUBLIC SCHOOLS

SCHOOL DISTRICT NUMBER ONE IN THE CITY AND COUNTY OF DENVER, COLORADO

FREE DENTAL CLINIC

ROOM 8, LONGFELLOW SCHOOL
18TH AND WELTON STREETS
OFFICE OPEN FROM 1:30 P. M. TO 4 P. M. SCHOOL DAYS

.....191..

.....

Address.....

Age.....Grade.....School.....
is recommended for free dental services.

By.....

D. S. T. 10-13-3M 36-995

Fig. 4.

DENVER PUBLIC SCHOOLS

BLANK 97, D.S.T. 12-12-3M 624

School District Number One in the City and County of Denver, Colorado

WILLIAM H. SMILEY, : : Superintendent

.....*School.* *Denver, Colo.,*.....

Mr......

Dear Sir:

An examination of..... *made in compliance with the School Law of Colorado seems to indicate defectiveness*..... *The law requires examination by some competent physician, and treatment if necessary. Will you kindly have such an examination made, and return this notice with the physician's report properly made out on the back of this card.*

Respectfully,

.....*Principal*

Fig. 5.

In the event that the pupil is eligible for the clinic, the principal is notified of the fact, and at the same time is told what week to send the patient to the clinic, and a card, Fig. 4, is issued to the patient, which card is presented at the clinic where an examination is made and the patient is given an appointment and an appointment card.

This appointment card is shown to the principal or teacher and the pupil is credited with attendance at school for time spent at the clinic.

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Fig. 6.

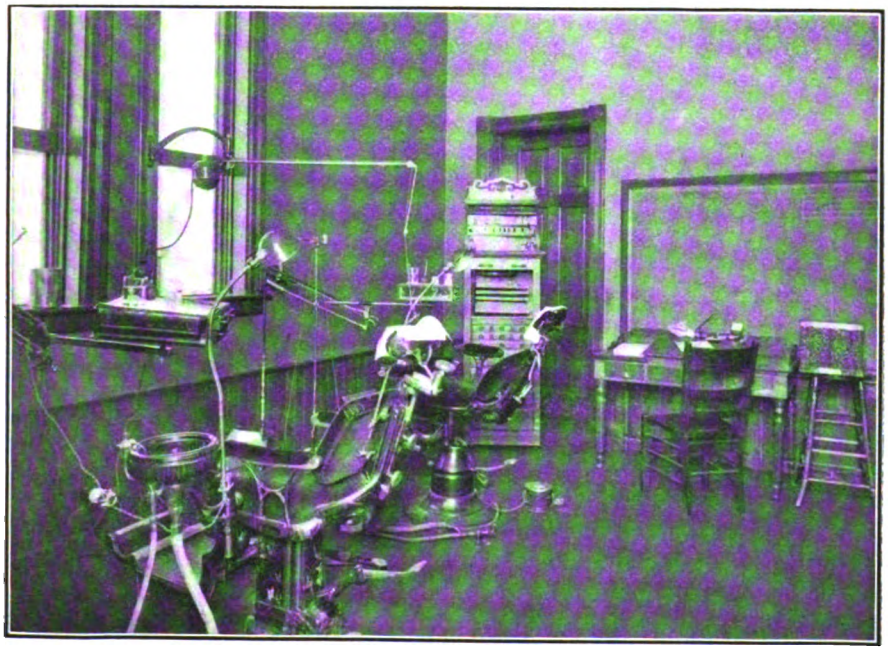


Fig. 7.

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REPORT OF PHYSICIAN

I have examined.....in accordance with your notice to the parent, and find the following conditions and have instituted the treatment as noted.

.....

.....

.....

.....

(*Signed*).....

Physician

Address.....

Fig. 8.

However, in cases where appointments are not kept the principal is notified and the pupil loses credit for the time, and the matter is investigated for further action.

In the event that the pupil is not eligible for the clinic, but is being hampered in school work by the need of medical or dental services, the principal or medical inspector issues a card, Fig. 5, to the parent or guardian of the pupil requiring that the matter be attended to within a reasonable length of time.

Fig. 8 shows the reverse side of this card, which must be filled in by the physician or dentist by whom the case is treated, certifying that the request has been complied with, and this must be returned to the principal before the pupil has a clear record. In cases where this card is issued to pupils who are subjects for the free clinic, the card is certified by the superintendent of the clinic.

While the clinic was operated by the dentists, the work of the superintendent was supplemented by the volunteer services of some one dentist each half day. As now operated by the School Board, the superintendent, at the request of the Board, is assisted by one senior student from the Colorado College of Dental Surgery, the college very willingly consenting to this arrangement, and the seniors take turns in attending for a week at a time.

The clinic, open every school day from 1:30 to 5 P. M., is working to its full capacity, and the Attendance Department has a large waiting list, showing that the clinic is even now unable to take care of the number of patients who are entitled and desirous of obtaining the service.

Reports of the work of the clinic are returned weekly and monthly.

An effort is being made this year to further increase the efficiency of the clinic by doing more permanent and less temporary work. No permanent teeth whatever are extracted where they can possibly be saved. All first molars are retained unless they are actually decayed

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Time Operated,	1912.....5 months		
	1912-1913.....9 months (school year)		
	Total 14 months or 280 days		
Cost of operation.			
Received from Denver Dental Association.....		$754.21	
Received from dentists, supply houses and interest....		990.26	$1,744.47
Time contributed by dentists for service at clinic, 280 half days at $2 50			700.00
	Total cost		$2,444.47
Less cost of permanent equipment.....		437.00	
Less expenses since close of school year.....		25.17	462.17
			$1,982.30
Charge annually 20% of cost of permanent equipment for repairs and deterioration one and one-half years 30% of $437.00			131.10
	Actual cost		$2,113.40
Different patients treated		2,800	
Average cost for each patient.....		75½ cents	
Average number of new patients treated per day		10	

Fig. 9.

beyond the bifurcation of the roots. The increase of the quantity of amalgam used is of itself an indication of the improvement being made.

Beginning this year the salaries of the superintendent and assistant have been increased fifty per cent. or more, and it is interesting to note the result of this increase on the character of the work done and the cost therefor.

Cost of Operating Clinic.

Fig. 9 gives the cost of operating the clinic for fourteen months, up to the time when it was taken over by the School Board, also the number of patients treated and the average cost per patient. Fig. 10 is a statement of the work done during the school year of 1912-1913, in comparison with that of October and November of the current school year.

This chart shows that the value of the work done in October and November, 1913, was ninety-five per cent. in excess of the cost of operating the clinic, while in 1912 it was only ten per cent. in excess of the cost of operation.

Effects of the Clinic.

Now, what has this clinic accomplished? Twenty-eight hundred children will grow up with a new idea of dentistry. Counting five persons to a family, fourteen thousand persons have been brought

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School Year, 1912-1913.			Oct. & Nov. 1913-1914.	
Total different patients.....	2,073		Total different patients.....	290
1 Amalgam filling for every	6 patients		1 for each	
1 Cement filling " "	6 "		1 for every	3
1 Cleaning " "	8 "		1 " "	4
1 Extratcion " "	2 "		1 " "	2
Examination	792		139	
Cleaning	280 at 1.00	$280.00	70.....	$70.00
Extraction	1,013 at .50	506.50	156.....	78.00
Amalgam filling	344 at 1.00	344.00	281.....	281.00
Cement filling	364 at .50	182.00	114.....	57.00
Gutta Percha filling....			18 at 50c.....	9.00
Root filling	177 at 1.00	177.00	28 at 1.00.....	28.00
Abscess treatment			1	
Arsenical Devitalization	119		40	
Removal Dead Pulp....			29	
Treatment	458		73	
Replantation			1	
		$1,489.50		$523.00
Operating cost		1,328.30		267.00
Value over operating cost		$161.20		256.00
		10%		95%

Fig. 10.

into closer touch with dentistry, and in many instances for the first time.

The common belief that those things which are not paid for are not appreciated may be true in a measure, but the healing arts are expected (in fact, it is one of their universal tenets) to extend relief to their more unfortunate brothers, and a profession enjoys a degree of appreciation and respect in proportion to the extent to which the benefits of that profession are extended to humanity. In other words, in proportion to the way in which that profession lives up to its ideals.

The actual recipients of these gratuities may not fully appreciate what has been done for them, but they do have a higher respect for our profession. Every patient treated will grow up with the knowledge that their children ought to have dental attention.

In addition, the thousand teachers in the Denver Public Schools have gained a better conception of dentistry, both as to the general need and benefits thereof.

Oral hygiene work will soon outgrow its name, if it has not already done so, for the name seems entirely inadequate to convey its scope and importance.

The work now becomes one of extending the field of dentistry; ex-

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tending its benefits to unfortunate humanity; extending the general appreciation of the need and importance of dentistry, and raising the standard of our profession and improving the services rendered.

The term "oral hygiene" gives but little hint of such a field, and in speaking of the work now it is well to remember what it is we mean by "oral hygiene."

Duty of Professional Men.

Every effective professional movement for the betterment of humanity and professional advancement must emanate from and be carried on by the profession as a body, and each member of the profession owes it as a duty to the profession and to himself to aid in that work.

Independent efforts are not a substitute for society work; for example, good-hearted John Brown, a carpenter, nails a few shingles on an old lady's roof to keep her dry and warm, and by so doing he helps the old lady, he himself feels more like a man for the act and he raises himself in the esteem of his neighbors. He has done a simple, kindly, neighborly act, one of the things all men should be doing much more frequently. However, his act did not help the cause of carpentry in the least. He did not do that thing because he was a carpenter, but simply because he was a man. On the other hand, had the carpenters of the country arranged that every poor person should have a dry roof, carpentry would immediately have acquired quite a different standing.

This illustrates clearly our relative obligations as men and dentists. Individual benefactions, even though they be in the form of dental services, are neighborly acts, while those accomplishments which are the result of combined society work are professional.

I mention these things to correct the point of view of so many who offer as an excuse for not helping in society work "that they are caring for the teeth of the Widow Jones' children and think that that is enough for them to be doing." It may be enough of that kind of helping, or it may be too much; but whether enough or not, it is not a substitute for the society work which every professional man should be actively assisting in.

I have spoken of the past and present, now what of the future? When favorable conditions present, we should be in a position to start new dental clinics, and a reserve fund should be established for such contingencies. In the meantime, our efforts should be directed to seeing that the school clinic already established is successfully continued, with an enlarged capacity, as conditions require.

The committee now has a very desirable opportunity to undertake an entirely new work in Denver. This consists of carrying out actual

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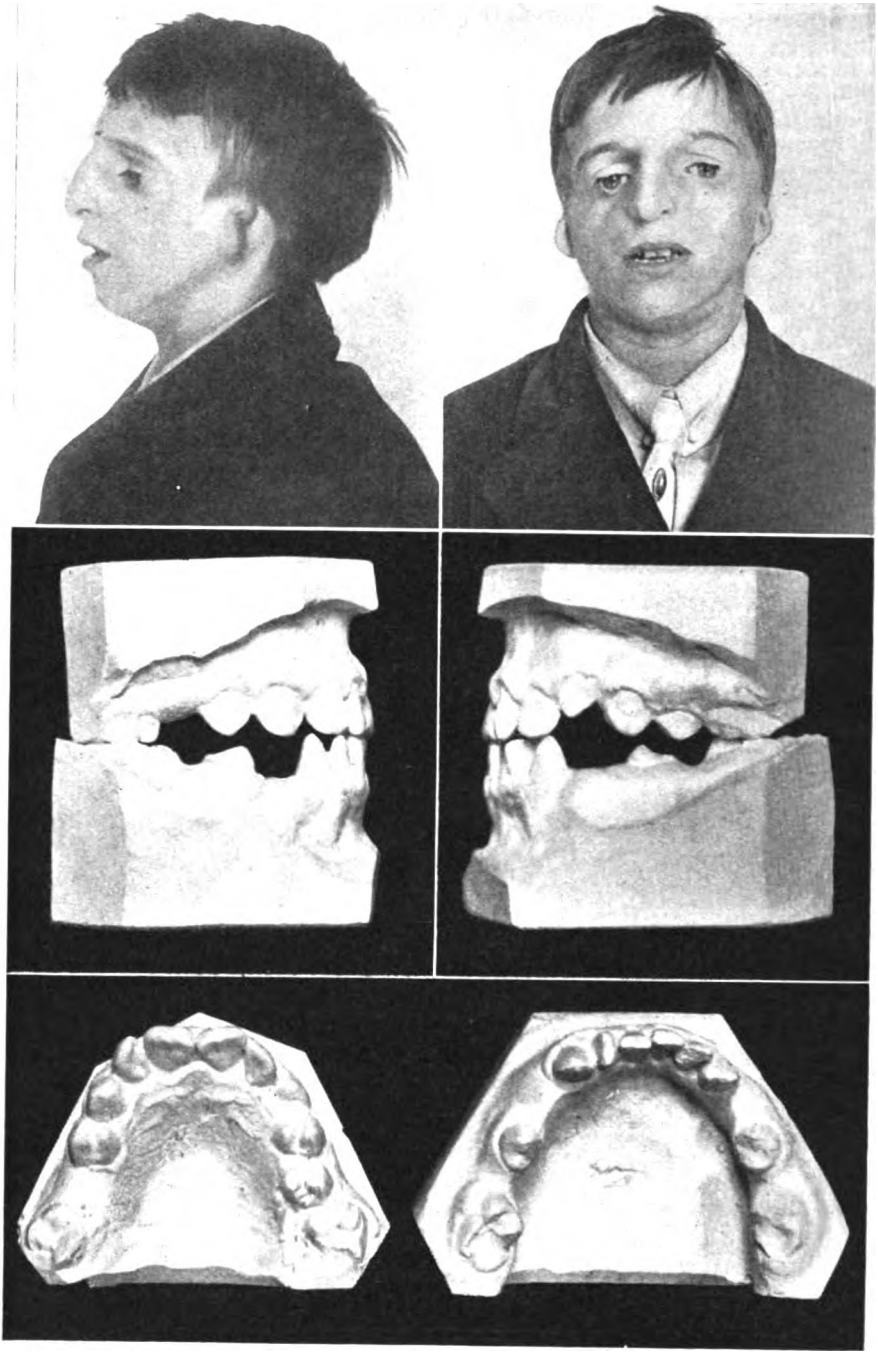


Fig. 11.

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mouth hygiene work in one of the special classes in the public schools.

Treatment of Special and Exceptional Classes.

At the Corona School there are a number of retarded classes which are known among the school authorities as "special classes," and also there is a class of mentally and physically deficient pupils which is known as the "exceptional class." This latter class consists of about twenty pupils in charge of two teachers. Some of these pupils were referred to the clinic at the special request of the medical inspector that something be done for them, as they were being hampered physically and mentally by the condition of their teeth. The needs being more extensive than could be undertaken at the clinic, the cases were referred to the committee. A plan was outlined whereby the teeth of the entire "exceptional" class were examined by Dr. Walsh, superintendent of the school clinic; Dr. Dorr, medical inspector of the public schools, and a member of the committee, with the object of ascertaining how many of this class were really suffering from such conditions.

The result of this examination disclosed the fact that the exceptional class had been cared for very well and relatively few actual cavities were found in the teeth, there being among the seventeen pupils, five pupils needing fillings, and the same number who were actually suffering from malocclusion sufficient to interfere with nutrition; however, the mouths of all of these pupils were in extremely unhygienic condition from the lack of efficient effort at cleanliness.

The plan proposed is to give this entire class a thorough prophylactic treatment, and immediately thereafter institute tooth brush exercises under the supervision of the teachers. For this purpose it would be necessary to purchase the very best of brushes, replacing them as soon as they show symptoms of wear sufficient to interfere with their cleansing properties, each child to have a brush and cup marked with its own name or number, cups and brushes of each child to be kept separate, rinsed thoroughly in a solution of formaldehyde after use and placed in a formaldehyde sterilizer cabinet under the charge of the teachers.

The advantage in taking this work up is that this class is constantly under the careful observation of the medical inspector, the principal, the teachers of the class and the school authorities, and everything is done for the class, which promises to be beneficial. This class of about twenty pupils is in charge of two teachers, which, with the other special needs, probably make this the most expensive class which the district has to maintain; which fact will of itself tend to make the school people even more than ordinarily observant, particularly as they all favor the plan. As no fixed schedule of studies is required for this class, sufficient time can be given to the details to make prophylactic exercises effective. These

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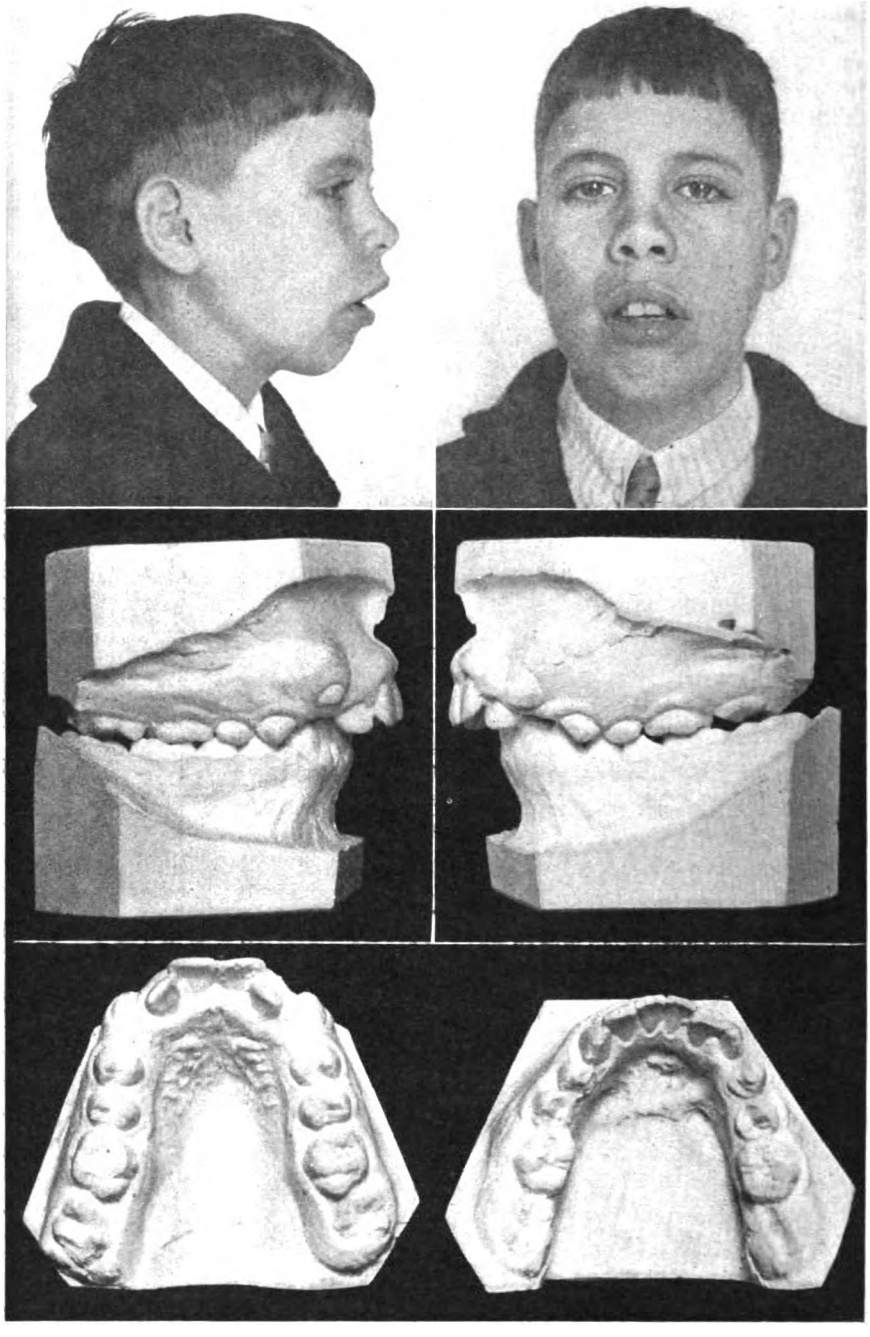


Fig. 12.

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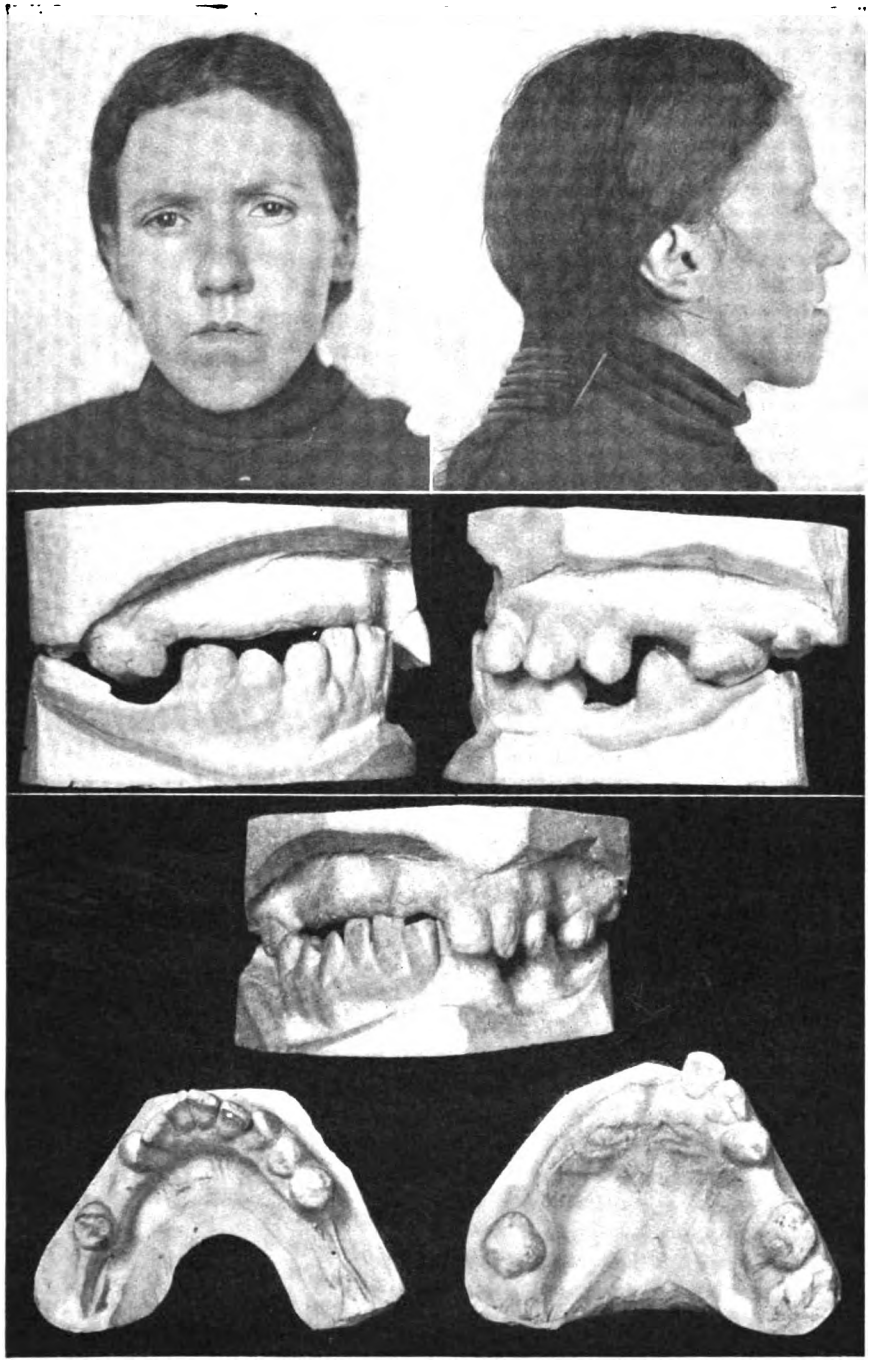


Fig. 18.

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are ideal conditions for making such an experiment and for recording the benefits resulting therefrom.

A few illustrations will give an idea of the condition of some of these pupils.

Fig. 11 shows a boy aged thirteen. Both external auditory meatii and the malar bones are lacking. The rudimentary ears have been grafted on. The internal ears are all right and he hears through his mouth and nose; but, of course, the acuteness of his hearing is greatly interfered with. The casts of his mouth show that proper mastication is impossible, and that the upper arch is very narrow, which probably contributes largely to his mouth breathing.

Fig. 12 is a boy eleven years of age. He also is a mouth breather. He has had adenoids removed and now has no nasal obstruction, but, as is shown by the illustrations, he cannot properly close his lips, while his tongue space is restricted by the narrow arches. Unless something is done for him he will go through life looking like an idiot and will gradually come to keep pace with his looks.

Fig. 13 shows an extremely unfortunate case of a girl of seventeen. The casts show what is left of her teeth. On the right side the upper molars practically touch the lower gums, while the remaining lower teeth touch her upper gums. On the left side are the only two of her teeth which occlude. In such a condition this girl is more hampered in life than though she had two legs cut off.

As mentioned before, there are only five in this class who are in need of operative work, all of whom can be easily taken care of at the School Clinic. There has been no difficulty in getting volunteers to take the other five cases which are in need of orthodontic treatment. With the addition of the prophylactic work as outlined, the mouths of the entire class would be put in efficient and cleanly condition.

The value of such work cannot be overestimated. The broader and more humanitarian our profession, the more honor is attached to belonging to it, and the greater the advantages accruing therefrom and the greater the responsibilities. Within the next five or ten years the vital history of dentistry will be written in the value of its services to mankind.

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Fetid Breath.

By Theodore W. Corwin. M.D., of Newark, N. J.

Read before the Central Dental Association of Northern New Jersey, Dec. 15, 1913.

Mr. President and Gentlemen of the Central Dental Association:

It gives me profound pleasure to be among you this evening. I am mindful of the honor you have conferred upon me in asking me to address you, and only regret that you should have to bear so terrible an infliction.

"O, my offence is rank, it smells to heaven."

But it is a great satisfaction to know that we stand upon common ground (!) as well as that we work together for human welfare. Our interests evidently are so closely intermixed as to have become, in not a small degree, mutual.

In 1910 I presented to the members of the Clinical Club some remarks upon offensive breath.

"I counted two and seventy stenches, all well defined, and several stinks."

I have since done some exploration, but will not promise that I can regale your suffering senses to any greater extent, and fear that I must exhibit "a very ancient and fishlike smell."

Seriously, we both encounter many cases in which foul breath is a marked, and sometimes, a characteristic feature, so that it may be important to consider together the factors concerned in the cause and cure of such annoyances. I assure you that much can be done to remove this symptom which makes life miserable for many people, both among those who are immediately affected and among the others like ourselves who must often encounter it at short range.

The normal breath of expiration possesses no odor, but it usually differs from that of inspiration in being warm and steamy from its higher content of heat and vapor of water.

Foul breath in itself seems not to work much direct injury to the organism, but to be most active by causing mental depression and thereby lowering the general vitality. The underlying affections, however, which go to produce the different forms of fetid breath are all injurious in themselves and constitute disease of various kinds. These conditions should always be sought after and combatted.

Odors Analyzed.

The nature of odors of whatever kind is not well understood. Their constitution is a chemical one, however, and a study of their formulæ shows that their molecules have considerable weight. (See Note A.)

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"Ramsay has pointed out that as a general rule substances having a low molecular weight have either no smell or simply cause irritation of the nostrils. He also shows that in the carbon compounds increase of specific gravity as a gas is associated to a certain point with a sensation of smell." "In the Marsh gas series—Marsh gas which is eight times as heavy as hydrogen gives no odor: ethane fifteen times as heavy as hydrogen has a faint odor; propane, twenty-two times as heavy as hydrogen, has a distinct odor. Among the alcohols a similar relation obtains. Methyl alcohol has no odor; Ethyl alcohol, that of ordinary use, when free from ethers and water, has a slight odor, and the odor rapidly becomes more marked as we rise in the series, till the limit of volatility is reached and we arrive at solids with such a low vapor tension that they give off no appreciable vapor at the ordinary temperature." To produce the sensation of smell a substance must have a molecular weight at least fifteen times that of hydrogen.

The odorous substances must be present in the atmosphere in the state of fine subdivision, or existing as vapors or gases. The fineness of the particles is remarkable because if the air conveying an odor be filtered through a tube packed with cotton wool and inserted into the nose an odor is still discernible. This completely removes from the air microorganisms less that the 1/100.000 of an inch in diameter. Substances exciting smell are no doubt usually gases or vapors. Graham notes that odorous substances are, in general, readily oxidized. They must also be soluble in water for the free olfactory surfaces of the nose are always covered with a thin layer of fluid, and the vapors must become dissolved in it to reach the olfactory rod cells. Moisture aids olfaction: thus it is well known that the odors of flowers are most distinctly perceived in the morning, or after a shower, when the atmosphere contains a considerable amount of aqueous vapor.

It would appear that the odors of animal effluvia are of a higher specific gravity than the air, and do not readily diffuse—a fact which may account for the habit of the pointer and bloodhound of keeping the nose to the ground. Such odors are very persistent and are apparently difficult to remove from any surface to which they have become attached. For illustration: the odor of a corpse may haunt a living person for days, notwithstanding copious ablutions and change of clothes.

Delicacy of Odors.

A grain or two of musk will scent an apartment for years and at the end of the time no appreciable loss of weight can be detected.

One part of sulphuretted hydrogen in one million parts of air may be perceived. The odor of mercaptan has been experimentally detected

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when the dilution was 1 to 50,000,000,000, and it was calculated that the weight of mercaptan so detected in 50c.c. of air was 1/400,000,000 of a milligram.

(These data upon the nature of odors have been obtained from the article "Smell," in the *Encyclopedia Brittanica,* written by John Gray McKendrick, Professor of Physiology in the University of Glasgow.)

Classification. No satisfactory classification of odors has been found possible.

Of fetid odors, Dr. Hutchinson of London has indicated the following types:

1. Putrefactive type—as in cheese.
2. Sulphureted hydrogen type—as in gangrene.
3. Garlic type—as from arsenic or bismuth.
4. Sweetish type—as in diabetics and beer drinkers.
5. Toxic or Hepatic types—as in biliousness and dyspepsias, but we can also recognize others as:
6. Ammoniacal types—as found in urinary disorders.
7. Acid types—as found in rheumatism.
8. Aromatic types—as found after use of foods and drugs.

Different degrees of heat and moisture in the breath modify its odor. Odors also vary in intensity or pungency. Other distinctions are made but are difficult of application. In fine, it may be said that some of these substances baffle description, beggar language and outrage our sensibilities.

Primary Origin. The sources of foul breath may be usefully divided into two great classes.

1. Those arising outside of the respiratory tract, or systemic effluvias.
2. Those which arise within the respiratory tract, the mouth included.

Class 1. Effluvia from without the Breathways.

These are true exhalations. that is, they all exist in the blood before they appear in the respiratory passages. They are excreted out of the blood into the lungs, and from the lining membrane of the whole breathing tract, of which the lungs are only an expansion. Such odors also transude in the exhalation from the skin and other surfaces which are exposed, and appear in the urine and other fluids. These odors may arise at any point and be conveyed thence in the bloodstream, thus arriving at the lungs.

When the enunctories, or eliminating organs of the body fail to sufficiently remove the products of internal metabolism, they may escape into the respiratory tract and taint the breath. Thus the intestinal glands

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may be inactive so that excrementitious products accumulate in the blood and finally escape into the breath, as in cases of constipation. Again, the production of such products may for a few moments be so rapid that the glands cannot act in time to prevent an overflow.

In cases of pulmonary tuberculosis which are often associated with badly depraved systemic conditions, I have very frequently detected a fetid, almost fecal state of the breath. This is most conveniently recognized by observing the contamination of the mouth thermometer.

Some cases of fetid exhalation have been observed to occur during highly emotional conditions. In these it may be conceived that their production rate exceeds that of elimination.

The urinous contamination of the breath may also be accounted for by the failure of elimination, where the kidneys fail, as in uræmia. The sour breath of rheumatic patients may also proceed from such failure. Various fevers, toxæmias, septicæmias and diabetes may also be cited.

Other conditions in which the blood gives off fetid exhalations are those in which it absorbs fetid products from distant surfaces. Thus in constipation with accumulation of bowel contents gaseous products are absorbed, carried to the lungs and then exhaled. Various aromatic elements of food and drugs are thus absorbed from the alimentary tract and appear in the breath as, "on the morning after."

Another set of odors which may be exhaled from the blood are those which have first been *inhaled* from without the body. Thus the air we take in may be offensive and its offensive principles may be absorbed into the blood and be subsequently *ex*haled—perhaps for a long time afterward.

Thus after inhabiting closed rooms which have become offensive the breath may show the same fetor for many hours after removal into an entirely pure atmosphere. We often find how rapidly a perfectly pure room may become contaminated by the exhalations of those who habitually live in close unventilated apartments. The odors arising in the course of many manufacturing processes may be thus transmitted, and many other instances might be cited.

It must be recognized that these causes may be and frequently are associated with the odors arising from absorption of the same emanations by the skin, hair and clothing of the workers and their subsequent escape from these parts.

Such distinctions are hard to make as a rule. The tendency of the most recent observers has been to emphasize the importance of the external sources just mentioned. Peculiar odors of the dissecting room may cling to the person of the anatomist after thorough bathing and complete change of clothing.

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Sometimes and perhaps happily, odors springing from parts outside of the respiratory tract may be *subjective* only, so that they are recognized by the bearer alone. Instances may be found among cases of constipation, abscesses and tumor of these organs. But most cases of ill-smelling breath are most truly objective in character whether subjective or not, and they can readily be perceived by all whose faculty of smell has not been destroyed. This is esepecially true of the second class of stenches: viz., those arising in the course of the air passages.

We have now considered many of the prominent occasions of fetor affecting the system in general, and although that category is by no means exhausted we may turn to such as spring from conditions localized in the breathing tract, which we have called Class 2.

Class 2. Odors Arising within Respiratory Tract.

The local causes of fetid breath are also greatly varied both as to their character and points of origin. Any part of the breathing tract, inclusive of the mouth, may furnish the conditions which produce this symptom. I shall say nothing in this assembly of past masters of dentistry, regarding odors proceeding from the teeth and the mouth. I need but to listen and learn.

The local causes of foul breath may be divided anatomically into:

A—General.
B—Nasal and nose pharyngeal.
C—Buccal and dental.
D—Pharyngeal.
E—Laryngeal.
F—Pulmonary.
G—Communicated from adjacent organs.

These all differ from the first class in that they have not been exhaled through the respiratory mucous membranes, but have become deposited upon them, independently of respiration. Their effluvia may therefore be described as being additions to the breath proper instead of essential parts of it.

It will be convenient to first consider cases of nasal origin.

Nasal Causes. Here, catarrhal conditions, of course, predominate. The altered mucous flow, however, gives no offense to our smell so long as it escapes with normal rapidity. When for any reason it is retained it soon changes and gives offensive characters to the breath. When pus appears in it other offensive characters arise, and the exhalation is described as heavy, sweetish and somewhat disagreeable. When free access of air to these discharges is withheld they rapidly become *foul*. This is found when these dis-

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charges form thick and adherent masses and the air current dries up their exposed surfaces into crusts. These latter prevent the penetration of oxygen and light to the undried matter under them, which rapidly putrefies. Putrefaction is inhibited to a notable degree by the normal fluids of the nose, but when crusts have formed these cannot exert their wholesome influence. The same remarks will apply to discharges retained within cavities to which access of air is prevented by the swelling and closure of the passages leading to them.

In the later stages of nasal colds an offensive breath occurs frequently and is due to alterations of the sticky adherent muco-pus. Irrigation of the nose and naso pharynx with saline solution gives prompt relief. When mucus and pus, and perhaps blood also, are so long retained that a crust is formed over them, odors of the rottenest kind are liable to occur. Such types are embraced under the title ozæna. The German designation "Stink nase" indicates this with more directness. Even in these frightful cases, when cleanliness is accomplished and rigidly maintained all odor ceases. Cases of simple ozæna are rare in which this is not practicable. Commonly the patient has lost his sense of smell and cannot perceive the stench which he bears about.

When catarrhal conditions extend beyond the main nasal channel so as to involve the sinuses, such as the maxillary sinus or antrum; or the frontal, ethmoidal or sphenoidal sinuses, a persistent discharge occurs. If obstruction to the rapid escape of this exudation exists a foul odor is liable to develop. Under such circumstances ulceration of the bony walls of these parts is apt to ensue. Such cases are commonly relieved by surgical measures which provide free drainage after removal of all degenerated and necrotic tissues.

A very serious occasion of fetor in the nose is syphilitic ulceration Many cases of ordinary ozæna are without doubt wrongfully adjudged syphilitic because both affections have such a horrible stench. Nevertheless the odor of syphilitic ulceration, associated with necrosis of bone tissue, is even more repulsive than that of ozæna. Without joking it is claimed to be so *distinctive* as to be pathognomonic of the disease. While the odor in these cases arises in materials which are quite separate from the living tissues of the body, its points of origin are nevertheless so difficult of access in most cases that in spite of great efforts to maintain cleanliness the stench can but seldom be more than partially suppressed Happily of all such chronic affections syphilis is perhaps the one most responsive to treatment. With but very few exceptions cure may safely be expected when appropriate treatment is exhibited.

That fortunately rare, but in man fatal, disease of the nose, glanders,

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involving as it does extensive necrosis of bone, is the occasion of a very intense stench. Injuries, foreign bodies, and various tumors of the nose may become very foul and even adenoid growths are often an occasion of some odor. Cases of diphtheria develop great fetor in the late stages when unchecked by treatment, but all parts of the respiratory tract are liable to be affected.

This category of nasal types, while by no means complete, may serve to exhibit some features which are common to all types.

Causes Found in the Respiratory Tract.

We cannot do much more than *summerize* these at the present time. We recognize that pretty much all febrile conditions, whether simple, septic or specific, may be complicated by local conditions which cause fetor of the breath. These are emphasized when epidemics of malignant form prevail. Tuberculosis may also act in this way at any point.

Pharyngeal Causes.

In the pharynx we commonly meet two considerable causes of offense. Chronic follicular pharyngitis is liable to be marked by retention of exudates in the enlarged glands, and consequent fouling of the breath. More frequent are the cases of chronic follicular tonsilitis. Examination of these cases show that the tonsillar crypts contain cheesy masses. Whether the tonsils be but slightly or are considerably enlarged the crypts may form large pockets in which secretions, epithelial cells, and particles of food accumulate and ferment with the development of foul gases. Again, cheesy masses may form and escape into the throat when their growth in size exceeds the space in the pockets. They may often be seen projecting from the surface of the tonsils. When such masses are removed and crushed an intensely foul and penetrating odor proceeds. When they are not so situated as to be evident on inspection pressure made over the tonsils from below upward will cause their extrusion or the flow of a very offensive milky fluid. The persistence of such conditions gives rise to much chronic throat trouble, and is also frequently responsible for gastric disorder.

Buccal Causes.

All forms of stomatitis give rise to offending secretions. All ulcerations are liable to become foul, as those from injury, syphilis, cancer, tuberculosis, abscess or other cause. Different forms of metallic poisoning are notable causes, especially those from mercury and lead.

The *larynx and trachea* may also be affected by all the processes already considered and with the same result of fetid products. In the lungs fetid breath is associated with some cases of tuberculosis and chronic bronchitis, notably where cavities have been formed by ulceration

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or by dilatation of segments of bronchial tubes. There is one condition however, which surpasses all other conditions of the breathing tract in the production of fetor. This is gangrene of the lung. Patients having this rare complaint need to have special apartments provided for them It is a fatal disease.

Lastly we may consider a few occasions of foul breath which are communicated to the respiratory tract from adjacent organs. Cases of discharge from the ear passages into the nasopharynx are instances. Discharges of foul materials, solid, liquid or gaseous, from the oesophagus, stomach and even lower portions of the alimentary tract may be expelled into the air passages. Again abscesses of the pleura, liver, kidneys, etc., may rupture into the pulmonary tubes and convey disgusting effluvia.

Pathology. Let us now consider for a moment the pathology underlying this symptom. The analysis of any one of those sources which arise in the respiratory tract will show the presence of the following factors:

Pabulum—Moisture—Heat—Retention
Seclusion from air and light—Bacteria.

There may also be

Alterations in the character of secretions,
Defective leucocytosis and phagocytosis.

The first five factors, it may be noted, are just those which conduce in the highest degree to the growth of the sixth factor, the bacteria. All ill odors in Class 2 depend upon the operation of bacteria, which are always present.

The bacteria are such as usually flourish best in the absence of air. or *anærobic* bacteria. Their activity may be greatly curtailed by providing free access of air to the fetid materials.

Treatment. We may find relief from this noisome category by considering the means we possess for combatting them.

The treatment demanded by conditions causing fetor may be summarized by reference to several important principles among which I would mention these:

1. Promotion of vitality, both general and local,
2. Cleanliness,
3. Antiseptics,
4. Deodorants.

Vitality. The outgoing breath is normally sterile and devoid of unpleasant odor. The normal activity of our tissues or their cells is antogonistic to bacterial activ-

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ity—at least of the kind alluded to. During health the breathing passages and their fluids offer much opposition to the development of fetid processes. The maintenance of vigorous health is therefore of the first importance in combatting a fetid breath. Hygienic living is to be made our first concern. With such support the body has wonderful powers of recuperation. Life in the pure fresh open air, pure water and pure food, well prepared and well masticated, wholesome exercise, sufficient sleep and repose and a calm and hopeful mind are to be sedulously cultivated.

Cleanliness. We have seen that fetor is not a product of the vital activity of our tissues. Its origin is therefore outside of them. It resides in materials which are not a part of us. The removal of such materials is therefore indicated and this is what we call cleaning, and when it has been accomplished we have cleanliness, and "Cleanliness is next to Godliness." Cathartics and other depuratives may be considered a means to this end.

Antiseptics. When bacterial deposits cannot be immediately removed by measures which produce cleanliness we may employ antiseptics. Pure air and sunlight are natural antiseptics and cannot be used too soon nor too freely. Artificial antiseptics are also agents which restrain or prevent bacterial activity but they are as a rule capable of destroying *vital* activity also, and hence are usually poisonous. They should not be used when simpler measures can be made available.

Deodorants. There are agents which may be used to conceal or destroy odors without removing their cause. They are obviously of but minor importance. They may even prove harmful by withdrawing attention from measures which would be corrective of the underlying disorder. As the perception of the odors of injurious processes is a great safeguard to our bodies, deodorants are prone to work against our normal security.

The application of these therapeutic principles may be considered in connection with the more important agents commonly employed. We consider, first, correct habits of living, as already suggested; second, fresh air and sunshine; third, pure water; fourth, some chemicals.

Fresh air with its normal content of ozone is of the first importance. Oxygen is death dealing to the germs of putrefaction; therefore provide free and continual ventilation. Sunshine avails much by stimulating our tissues into activity. It also restrains the life and operation of noxious germs within us as well as without.

Pure Water. As water may be said to be at the base of our tissues, its value as a medium of cleanliness is apparent. Water promotes metabolism and secretion

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and assists phagacytosis; it conveys oxygen in solution to festering spots; it dissolves foul vapors, mixes with fluid discharges, and softens and dissolves firmer exudates, floating them away until final disposition is accomplished. Water is further able to carry in solution various other agencies of corrective character, such as salt and other antiseptics.

Air and water are the great natural disinfectants; they are too much feared and too little used. Let both be used externally, internally and eternally.

Chemical Agents. Sodium chloride, bicarbonate and borate in about one per cent. aqueous solution are very valuable in effecting cleanliness in the air passages; they also excite the normal secretions and they inhibit germ action. Phenol is well known as a bactericide. In combination with the sodium salts we have just mentioned it helps to constitute the famous solution of the late Dr. Dobell, of London, England. Salol and sodium bicarbonate may be used together in powder form; in contact with water they liberate phenol and salicylic acid. Limewater, potassium permanganate and chlorate are often used. Other valuable formulæ contain chlorine, iodine or sulphur or their compounds, or various metallic salts; notably those of mercury, silver, zinc and alum. Of organic origin we have a long line of aromatic oils and their derivatives—also alcohols and empyreumatic products. Other substances, and some of the above, are prepared synthetically. Digestive agents have been employed to dissolve offensive materials. Hydrogen peroxide is often of especial value, being efficient and non-poisonous. The neutrallized three per cent. solution when diluted to twenty-five per cent. strength by addition of water may be used upon all open surfaces; in closed or nearly closed pockets it may act dangerously by the rapid liberation of gas coincident with its action. Formaldehyde is a most efficient and powerful agent. Being volatile it has advantages in many cases: its vapor is so pungent that care must be used lest spasmodic strangulation result from its inhalation. The ordinary forty per cent. solution may be used locally when reduced with water to about one per cent. formaldehyde strength. In this dilution it is also a most energetic deodorant for a tainted atmosphere. After being sprayed into the air of a room for a moment the most offensive effluvia will almost instantly be destroyed. Proper ventilation should not be neglected when using this valuable short cut to comfort.

From these considerations it may be said that every man who claims to be scientific should be able to construct all the antiseptic and deodorant preparations his work requires without resort to nostrums.

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Note A. Chemistry of Odors.

"The present state of our knowledge does not permit a strict correlation of odor and chemical constitution. One theory regards odor as being due to osmaphoris or odor producing groups in much the same way as color is associated with chromophoris.

Examples are hydroxyl (HO), aldehyde (CHO), ketone (CO), ether (O), nitrite (CN), nitro (NO_2), etc. We may observe that N.G., or iso-nitrite is associated with an unpleasant odor.

As a general rule homologues have similar odors, but many exceptions are known so that members of even the same group are not invariably associated with the same odor. In further explanation it is said that while the triply linked carbon system is generally associated with strong and unpleasant odors, the doubly linked system gives pleasant ones."—From article, "Perfumery," *Encyclopedia Brittania.*

Report on the Cement Lute in Inlay Work.

By J. B. Parfitt, L.R.C.P., M.R.C.S., L.D.S., England.
(*Section III. Sixth International Dental Congress, London,* 1914.)

It would be difficult to overrate the importance of the cement which fixes an inlay into its containing cavity, for if the cement gives way, the most perfect inlay ever made will be a failure, whereas if the inlay should get broken, or even come out, the tooth will at least be preserved from decay as long as the cement lining remains intact.

With a considerable degree of truth an inlay may be defined as "a cement filling the exposed part of which is to a great extent, although not entirely, protected by a layer of porcelain or metal," and a discussion of the cement lute practically resolves itself into an inquiry as to how far such a composite filling possesses the advantages and avoids the disadvantages of one composed of cement alone.

It may be stated at once that inlays have most of the advantages of cement, such as freedom from molecular change, and from irritation or staining of the tooth substance.

Changes in Cement.

This statement requires perhaps a little qualification or explanation. Laboratory experiments have certainly shown that after setting, cement undergoes changes, both in its internal structure and in bulk; experience seems to show that, under ordinary conditions, change in bulk must be quite small, many old cement fillings on removal proving to have a joint so close that there seems to be almost an actual

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adhesion to the dentine; moreover, the particular disposition of the cement when it forms the lute of an inlay renders a slight change in bulk of comparatively little importance; even if there were a very large contraction of the order of 1 per cent. linear, the effect on a cement margin 50 microns broad would be to open a chink only .5 micron broad, and in all probability the utmost we could expect would fall far short of this amount. With regard to absence of irritation, metal inlays will, of course, conduct heat to the pulp less or more in proportion to the thickness of the cement that lies between.

The important advantage of facility of manipulation cannot be claimed for inlays at all.

Disadvantages of Cement.

I will now pass on to the disadvantages of cement. Of these the only one that calls for discussion is its lack of permanence, cement fillings suffering both from mechanical wear and from chemical solution. Incidentally, this loss of substance frequently leads to the formation of a rough surface, and consequent mischief from lodgment of food.

Mechanical wear, that is the loss of substance by abrasion, is in inlay work prevented by the peculiar disposition of the materials which form the composite filling, as the hard layer of the inlay itself, whether it be metal or porcelain, protects the underlying and relatively softer cement from the stress of mechanical wear; the grave hygienic disadvantage of a rough surface is also avoided, one of the most valuable properties of inlays being that they can be made to take and permanently retain a high polish.

The question of chemical solution of the cement lute is one that will demand more detailed consideration than that of mechanical wear, as it is by no means so evident that the layer of inlay material will in this case afford adequate protection to the cement from the fluids in the mouth capable of dissolving it. If the fit of an inlay were perfect, as perfect, for instance, as the fit of a well-made glass bottle stopper, and if such an inlay could be accurately cemented into its place, we should have perfect and permanent protection of the cement lute; in fact, we should have a filling which would be everlasting, subject only to undermining by fresh caries, or the incidence of an overwhelming force. Unfortunately this ideal seems impossible of attainment; perhaps the nearest approach that can be made to it without much difficulty is by the use of the Dall method of grinding both cavity and inlay material to a form with a circular cross-section, the inlay itself being a truncated cone of small taper. In actual practice the protection of the cement is never absolute, there is always some area of it exposed, and unfortunately the dissolving fluids

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can penetrate into chinks and round corners and reach places that are quite immune from the attacks of mechanical agencies; in fact, it may be that in some cases they act all the more quickly if they are not subjected to too much disturbance.

From the time when inlays were first introduced, the solution of the cement has always been the point as to which inlay workers have had doubts and fears, and, on the principle of a chain being no stronger than its weakest link, many have no doubt felt that an inlay would last no longer than a plain cement filling; experience, however, has shown that inlays have a very good record for lasting properties, and that in actual fact the cement is protected from solution to a very considerable degree.

Factors Influencing Cement Line.

In discussing the amount of protection from solution which its peculiar distribution gives to the cement, two questions call for consideration, namely, the factors that determine the thickness of the cement layer, and the influence which this particular manner of distribution has on the rate of solution.

The factors which influence the thickness of the "cement line" are:

(1) The amount of discrepancy (if any) between the dimensions of the cavity and inlay.

(2) The shape of the cavity in sections vertical to the floor.

(3) The size of the grains of cement.

(4) The consistency to which the cement is mixed and the amount of pressure used in forcing the inlay into its place.

(1) The discrepancy between the sizes of the cavity and the inlay will vary in different cases according to the material and method made use of.

Porcelain inlays made by the usual method of swaging a foil matrix into the cavity or some reproduction of it must of necessity be smaller than the cavity to the extent of the thickness of the matrix. A useful and frequently employed thickness of foil is one thousandth of an inch, or 25 microns, and this would be the width of the chink surrounding the inlay, and consequently the thickness of the "cement line."

In the method invented by and named after Dr. Peck, the thickness of the foil matrix does not come into the problem at all as it is made on a counter, reverse, or to use a photographic analogy, a negative of the cavity, and thus is itself an exact size model thereof in its internal dimensions. In practice it is possible, with care, to make inlays that will go into the cavity with almost what engineers would call a "driving fit."

Of the methods in use for making gold inlays that of the "Alexander plastic gold" probably yields an inlay the size of which is very near indeed to that of the cavity. Theoretically this should be the case, because

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the gold is actually molded into the cavity and is never melted in all the subsequent operations. This conclusion is borne out by experience, as it is quite possible to make inlays by the Alexander method with margins sufficiently good to bear inspection under a magnification of eight or ten diameters.

Faults of Cast Gold Inlays.

A somewhat similar result, both theoretically and practically, is arrived at by the "reinforced matrix" method, which consists in casting into a platinum matrix in two stages, the matrix, with its cast "core," being reburnished to the cavity margins before the second casting which completes the contour.

The ordinary or "lost wax" process generally yields an inlay which is too small for the containing cavity. It is not an easy matter to give a definite estimate of this contraction, because it is a sum of several different amounts, due to different causes which fortunately to some extent neutralize each other.

The causes of the discrepancy between the size of a cast inlay and its cavity are:

(i) The contraction of the wax pattern in cooling from mouth temperature to that of the investment. Some figures given by Van Horn* show that this is about of the order of .0002 for each degree Centigrade.

(ii) Expansion of the investment on setting. This may be taken to be much the same as that of plaster, and in the case we are considering would probably be negligible; any influence it would have would be in the direction of lessening the total contraction of the inlay.

(iii) Expansion of the investment in heating from room temperature to that of casting. This seems to be quite large in amount, Van Horn finding that there was a difference of about 1 per cent. linear between a block cast in a red hot mold and one cast in a cold one.

(iv) Contraction of the gold in cooling from its molten state to body-temperature. The co-efficient of expansion of gold is given as .000015 per degree Centigrade between 0° and 100°, so that the total contraction would probably be 2 per cent. or more.

Faults of Inlays Overcome by Cavity Shape.

The sum of all these separate discrepancies almost always results in a certain amount of contraction, varying according to the manipulation employed; in some cases it may be as much as 1 per cent. linear or even more.

(2) The shape of the cavity is of considerable importance in this connection, because in some cases a discrepancy at the margin can be

* "The Wax Pattern: a technique," etc., etc., by C. S. Van Horn, D.D.S., published in *Dental Cosmos*, 1912, p. 973.

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lessened or removed altogether by the inlay sinking slightly into the cavity. The extent to wihch this diminution of the marginal chink can be carried depends on the amount of the departure of the cavity walls from the perpendicular. If the containing walls are perpendicular to the cavity floor, that is, if they are parallel to one another, it is obvious that no amount of sinking in of the inlay towards the floor will diminish the marginal chink at all. In any actual case the distance the inlay will have to sink into the cavity in order to bring its edge into opposition with the enamel margin will be the width of the marginal chink multiplied by the cosecant of half the angle at which the opposite sides of the cavity are inclined to one another: thus if the marginal chink is 20 microns broad and the opposite sides of the cavity are inclined at a right angle to one another, that is if they are each inclined 45° away from the vertical, a sinking of the inlay 28 microns into the cavity will bring it into complete apposition with the cavity wall. In the case of parallel walls cosec. 0° is infinity which corresponds with the statement made above, namely, that in this case *no* amount of sinking in of the inlay will make any difference to the marginal chink: the other extreme case would be the apposition of two flat surfaces, such as might occur in the fitting of a tip to a front tooth, here the opposite walls of the cavity may be considered to be in the same straight line, or to have an inclination of 180° to one another; half 180° is 90°, and cosec. 90° is 1, which corresponds to the fact that here a theoretically perfect joint is obtained by the inlay settling nearer to the tooth by an amount equal to the thickness of the foil matrix used.

These considerations justify us in concluding that with correct cavity preparation and choice of a suitable method we should theoretically be able to make an inlay whose margins are in perfect apposition; we have, however, still to reckon with the cement itself.

Influence of Cement Grains.

(3) The actual size of the grains of the cement is a matter of the greatest importance, as it is certain that many of them retain their individuality after mixing.

Valuable papers have been published, notal by Head* and Poundstone,† on the problems of the inlay cement line.

It appears that in the ordinary cements we must expect grains 25 microns thick or even larger. so that it is better to use a cement ground specially fine. We shall probably not be very far wrong if we assume that the size of the cement grains will prevent the reduction of the joint much below 25 microns.

(4) The amount of pressure used in setting the inlay will naturally

* "Tests on the Inlay Cement Problem," by J. Head, D.D.S., *Dental Cosmos*, 1905, p. 779.
† "The Cement Problem in Inlay Work," by G. W. Poundstone, D.D.S. Published in *Dental Cosmos*, 1904, p. 756.

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influence the thickness of the cement margin to some extent. Some experiments made by Head showed that with a block ¼ in. square, eight pounds pressure with a certain cement gave a film 15/10,000 in. or about 37 microns, an increase of the pressure to one hundred pounds caused a reduction of the thickness of the film to about 22 microns; with another cement a similar increase of the pressure caused a reduction of the thickness from 25 microns to 15 microns.

A hundred pounds might seem a very great pressure, but we must remember that it was distributed over the area of a ¼ in. square, and that what counts in these matters is not the total pressure, but the amount of pressure per unit area. If the floor of the cavity were deepened so that the pressure fell on the margin alone, its intensity in the narrow band around the edge of the inlay might well equal or even exceed that used in Head's investigations. It should be mentioned that Head obtained films as thin as 7 microns, using specially ground cement powdered and a pressure of only 8 lbs. to the ¼ in. squire.

Solution of Cement About Inlays.

It is this peculiar disposition in a thin layer presenting only its edge to the solvent action of the saliva that explains the relative permanence of the cement forming the lute of an inlay.

Other things being equal, the rate of solution of a substance will depend on the area of it exposed to the action of the solvent and the rapidity with which the saturated solution can be removed so that a fresh portion of solvent can be brought into action.

In this particular case the area exposed is small; nevertheless solution will no doubt go on at first as rapidly as with a plain cement filling in the same mouth. In a short while the exposed edge of the cement will come to lie at the bottom of a narrow and relatively deep chink in which the saturated solution will tend to stagnate, especially as the chink will get more or less choked up with all sorts of insoluble débris. In most cases solution will go on with less and less rapidity, and in many will, after a time practically come to a standstill altogether; in any particular case the rate will depend on several different factors, such as the chemical and physical characters of the cement, the composition of the patient's saliva, and the position of the joint in relation to the bite. In this connection it is, I think, a well established and remarkable fact that although the cement does wash out to some depth, the tooth very frequently remains free from fresh attacks of caries.

The rate of solution may possibly be affected by the nature of the material forming the inlay. Thus it is conceivable that a gold inlay, owing to its relatively large conductivity and co-efficient of expansion for heat, might be subject to frequent small changes in bulk, and so tend to

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help the renewal of solvent in the joint: there may also, under some circumstances, be a slight amount of electrolytic action going on at the surface of a metal inlay.

Influence of Opaque Cements on Porcelain.

The influence of a layer of opaque cement on the appearance of a porcelain inlay deserves perhaps a brief consideration.

Both porcelain and tooth substance are translucent materials, and, as with all other bodies, their "shade" will depend both on their own nature and on the illumination they receive; moreover, the light they send to our eyes comes not only, nor in this case even mainly, from the surface, but also from layers which lie deeper down, and in their passage through the porcelain or tooth substance the light rays are broken up and reflected many times.

Under ordinary circumstances the "lighting" of the teeth is from above downwards and backwards, and the apparent shade varies considerably with the raising or lowering of the upper lip. If now a central tooth has its tip restored with porcelain, and an opaque line, although thin, and it may be quite invisible, runs horizontally across it, the relative shades of tooth substance and porcelain will alter with every alteration in the level of the upper lip. The reason of this is that the opaque layer prevents the basal part of the tooth from receiving any light from the occlusal part, so that each gives back just the light it receives from the outside source, and while the porcelain tip remains constantly much the same "shade," the base looks light or dark according to the position of the lip. If instead of a transverse layer there be a vertical one running from before backwards, the raising or lowering of the lip will affect both halves of the tooth in the same way; hence a porcelain restoration with a vertical joint can be so matched that it looks well in all conditions of lighting, whereas one with a horizontal joint will only be at its best if one particular set of conditions is realized, and especially with one particular position of the upper lip.

The same principles govern the lighting of porcelain inlays in other positions; in the case of interstitial cavities in canine teeth, for instance, except that the conditions of illumination are not so changeable, the front part, whether it be porcelain or tooth substance, tends always to throw the back part into shadow, so that mesial inlays should be made darker and distal ones lighter than the original color of the tooth.

Conclusions.

(1) The cement lute confers on inlays all the advantages of cement except facility of manipulation.

(2) The thickness of the film at the edge can by suitable choice of method be theoretically reduced to the size of the grains of cement.

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(3) Such a film is in most cases practically immune from solution and altogether immune from mechanical wear.

(4) With an opaque cement the character of the lighting of a porcelain inlay depends on the direction of the plane of the join.

Report on the Filling of Teeth with Cast Gold Inlays and on the Present State of the Art in the United States.

By Rodrigues Ottolengui, M.D.S., D.D.S, LL.D., New York City, U.S.A.
(*Section III. Sixth International Dental Congress, London,* 1914.)

In 1908, at a meeting of the Odontological Society of New York, Dr. Wm. H. Taggart announced a new method of filling teeth, by making a pattern of the desired filling, investing the same in a seamless mold and reproducing this pattern by casting molten metal under pressure. At the same meeting he presented a casting machine with which this process could be successfully conducted.

The announcement and description of this new method of filling teeth aroused a greater interest than had any other announcement ever made in relation to dental practice. Within a year thousands of men were utilizing the casting process, and numerous inventors and manufacturers were offering for sale casting machines, with which the claim was made that cast fillings could be made to better advantage than with the Taggart apparatus. Your reporter believes that this will be an appropriate moment for dealing briefly with this subject of machines.

Casting Machines. Casting machines may be divided into three classes: those utilizing direct gas pressure, inclusive, of course, of air, steam, and the like; second, those utilizing the forces exerted by centrifugal motion; and third, the so-called suction machines. Men claim success with all these various devices, but it must be remembered that the minds of men vary, and that personal ideas and standards differ proportionately. Suffice it then to say that in the opinion of your reporter no machine is the equal of the Taggart apparatus, in support of which view he may state that experts in the use of the Taggart machine, both in New York City and in Chicago, have made test cavities, for which they have readily made accurately fitting castings, which experts with other appliances have been unable to duplicate. Conversely, no one has produced a casting with any rival machine which cannot be duplicated with the Taggart.

Early Problems. With the adoption of the casting process, operators at once met with difficulties and obstacles, which often produced castings so poor that they could not

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be used. The faults in the inlays were mainly of three kinds. First, inlays larger than the original pattern; second, inlays showing feathers, in two or more directions; third, inlays spoiled by having minute or even large globular masses attached to their surfaces.

Many extensive and more or less scientific investigations and experiments were undertaken to solve these seemingly unsurmountable difficulties. Multifarious theories and explanations were advanced to account for these harassing troubles. It is worthy of note that men of keen minds and of analytical judgment, nevertheless, advanced antagonizing theories in accounting for quite similar phenomena. I need not take up the time of my confrères in this Congress by recounting the differing views of these different investigators. But let me say this, that in my opinion there would have been less difference of opinion and less divergence of reported results had the investigators been content to take the art as it was given to them by its originator, following his instructions, using his apparatus and materials, and thus working along exactly similar lines of endeavor. Unfortunately, this was not the case. Instead of attacking the problems with unbiased minds, our research workers in the main solved the troubles by mental processes first, and then undertook to prove themselves correct by clinical methods, which, however ingenious, were all destined to fall short of the truth, because of the biased state of the minds of the investigators. To make clearer what I am here stating, men who had never used a Taggart machine met definite failures with some other machine, and spent months of energy explaining and accounting for these phenomena as though it were a fact that they would occur with the Taggart or any and all other machines, when often, the particular trouble upon which so much scientific research was expended did not occur at all in the practice of the men who had mastered the Taggart process, using Taggart materials and the Taggart machine. For these reasons it is the firm belief of your reporter that the art to-day would be much farther advanced had the dentists of the world adopted Taggart's apparatus and directions from the outset, and had no other machine ever been constructed. For it is an absolute fact that the men who have done this, those that have studied the process and mastered it; those that use Taggart's machine, his wax and his investment, and use them always in exactly the same manner, have the satisfaction of knowing that every inlay will accurately fit the cavity for which it is constructed. They also know that on the rare occasions when they meet a failure, that it has been themselves, and not the process nor the materials that have failed.

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The Solution of the Problems.

It will be appropriate at this point to explain briefly how the faults met with early in practice are really to be explained and obviated. That they have been obviated is demonstrated by the statement that in the office of your reporter, and of several other exclusive followers of Taggart's directions, no inlay has been discarded nor made over during the past three years. I have this assertion from men of national reputation and of undoubted honor.

Referring to the three main faults, previously mentioned, let us consider them briefly. First, inlays larger than the original pattern. This was no uncommon experience in the early days of the art, and not a few methods of overcoming the trouble were promulgated. One such method was to coat the outer surfaces of the inlay with wax and then reduce the cavo-surface by immersing the inlay for a short time in a gold solvent. Another proposal was to place the wax pattern in ice water and to mix the investing material with ice water. The evident theory was that the chilling of the wax and the use of cold in mixing the investment would counteract the expansion of the mold when heated up to receive the cast metal. But the true method of producing an accurate casting does not depend upon the utilization, but rather upon the avoidance of extremes of temperature. The wax should not be chilled; the investment should not be made with cold water, and the mold should not be extremely hot when the cast is made. On the contrary, the effort should be made to work as close to room-temperature as possible, the wax and investment thus being neither warmer nor colder than the surrounding air, while the mold itself should be as cool as possible, and consequently as little expended as possible. Success indeed depends more upon the constancy and accuracy of technique than upon the utilization of any extraordinary means of overcoming faults, which should not occur at all. Such a method will be presently described.

The second fault, that of having feathers extending from the casting, is directly traceable to three co-operating causes. First, the use of an investment which will crack during the heating necessary for burning out the wax; second, the presence of these cracks in the investment, especially when the mold is hot at the moment of casting, thus opening the cracks to their ultimate. Third, the use of too great pressure in casting, thus forcing the molten metal into the crevices. The obviation of feathers, therefore depends upon the use of an investment which does not crack at the temperature needed for melting out the wax. Second, upon permitting the mold to become as cool as room temperature will allow, and keeping it as cool as possible during the casting. And, finally, upon using a low pressure, so as to avoid forcing metal into crevices.

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Lastly, the presence of globules on the surface of the inlay is mainly due to improper mixing of the investment, or to improper application of the investment compound to the surface of the inlay, or to both combined.

The Successful Process.

The following are the essential steps in the process if accurate results are to be had. First the wax used for the pattern should soften at a moderate degree of heat, and should harden at the ordinary temperature of the mouth. It should not be overheated, but should be softened sufficiently to take an accurate impression of the cavo-surface and of the margins, yet kept hard enough so that the mass of the material furnishes resistance under pressure, sufficient to force the outer surface accurately against the cavity walls and margins. The wax, once seated, pressure should be continued until the wax has fully hardened. This pressure should be constant and in the direction best assuring the certainty of producing accurate adaptation. Pressure continued in this manner guarantees us that the wax is accurately fitted to the cavity, not a few moments prior to its hardening, but at the final moment of hardening, after which there will be no danger of alteration through contraction, provided the wax is not cast into water colder than room temperature. The best method of assuring the unalterableness of the pattern is to invest it immediately, using water at room temperature.

Having thus procured a pattern fitting at the moment of complete congelation, the next step is properly to invest the same. The investment and water should be always weighed so as to insure definite results. It should be slow setting, and should be rotated for at least five minutes to insure the expulsion of air globules. It then should be evenly spread around the pattern and the surrounding secondary investment poured in such a manner that the operator may be assured that during the process the primary investment does not move so as to expose any surface of the pattern, thus inviting the imprisonment of air during the addition of the secondary investment, which, of course, should be made with the same mix of material used for coating the pattern.

The wax should be removed with moderate heat, and this heat should be continued until all gases resulting from the combustion of the wax shall have been eliminated. This heat should never be extreme enough to risk injury to the mold by overheating, nor should it be too long prolonged. A definite burner should be used and a definite time employed, for by this means only can definite results be obtained. The mold should then be permitted to cool to room temperature.

Many wonder what is meant by the phrase "casting in a cold mold" By this phrase it is meant that the mold should be as cold as possible.

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It will necessarily become heated during the melting of the gold, but it is manifest that if the co-efficient of expansion and contraction of the investing material at that temperature be the same as the co-efficient of expansion and contraction of the melted metal, this slight expansion of the mold aids rather than hinders the accuracy of the result. The gold nugget should be heated almost to the melting point, and then quickly transferred to the crucible of the mold and the blow-pipe flame kept small so as to play on the gold rather than upon the mold. In this manner the gold can be melted to the boiling point, while the metal ring around the mold will be only a little too warm to be taken in the fingers.

The pressure should be low. Those who use the Taggart machine should have the pressure gauge register about five pounds when the blow-pipe flame is used. The register will rise to six or seven when the cast is made. Finally, a large excess of gold will insure a better casting than where a small nugget is used. The above process accurately used will produce inlays which will fit as well as the wax pattern. No process can do better. If the fit is faulty, either the pattern was at fault, or some other step in the process must have been inadequately observed.

Methods of Making the Wax Pattern.

When Dr. Taggart first disclosed his method he directed that the wax should be pressed into the cavity of the tooth itself, carved into desired shape, removed and reproduced in gold by casting. This has now come to be known as the "direct method." But another method is much advocated by many prominent practitioners, which is known as the "indirect method" This involves taking an impression of the cavity in an impression wax and from this making a replica of the original cavity (sometimes called a mold, or die) in which to form the wax pattern. This replica is made of various materials, such as cement, one of the quick-setting silver-tin amalgams, or copper amalgam.

For the indirect method many advantages are claimed, the more valid of which are as follows:

First, if a casting is spoiled another may be made without recalling the patient. This can only appeal to those using unreliable machines, or materials, or inconstant methods. As has already been explained, with a proper machine and a definite technique constantly followed, failure is absolutely not necessary.

Second, greater facility in carving the pattern to proper form. This is largely a matter of personal preference. Many who use the direct method claim greater satisfaction in carving in the mouth with the adjacent natural teeth as a guide.

Third, greater perfection of adaptation at the margins, especially at the cervical margin, and more particularly so when this margin is

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below the gum tissue. In reply, the direct method men declare that if a perfect impression of all the margins can be obtained with the impression wax, it can likewise be obtained with the pattern wax, and that a better marginal fit will be had if this original first impression be utilized for making the pattern.

Other advantages are claimed for the indirect method, and disputed by the direct method men, but probably the only real advantage, if indeed this be one, is that the indirect method permits the operator to relegate a larger share of the work to an assistant. By this means he need only to take an impression of his cavity, give this to his assistant and at a subsequent sitting receive the inlay ready to cement to place.

There is no doubt that beautiful work is done by men of both schools, and whilst your reporter believes that the expert with the direct method will always make a better inlay than the man equally expert with the indirect method, he is not at all sure that the percentage of dentists per thousand who could accomplish satisfactory results may not be greater with the indirect method than with the direct.

Against the indirect method it must be said that if the operator himself should do all the work he must lose a great deal of time, for manifestly all the time expended in investing the impression and making the replica is time added to the process.

It would be extremely interesting and instructive to have the question of the adaptation of inlays made by the indirect method scientifically tested. It is the firm belief of your reporter that inlays made by the indirect method are smaller than would be an accurate pattern made in the original cavity. This explains the ease with which the majority of inlays made in this manner may be set, and the difficulties met with in complicated forms, such as those for M.O.D. (Mesial-occlusal-distal) cavities. This also explains why so many advocate that the M.O.D. cavity should be filled with two inlays, interlocking together, whereas the workers by the direct method make a single inlay for this style of cavity.

Cavity Margins.

Your reporter does not consider that cavity preparation is strictly a part of the subject apportioned to him, but he would like briefly to touch upon a single aspect thereof, because of a feature which is not widely known.

There has been much contention as to whether the cavity should be prepared with a bevelled margin or as for a butt joint. Those who favor the bevelled margin declare that the arrangement of the enamel rods demands that a bevel equal to at least one-third of the length of the rod is essential to future safety. Those who like the butt joint demand that the margins of both enamel and inlay should be as nearly as possible

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at a right angle, and they argue that this arrangement leaves the enamel rods strong, because the enamel rod usually lies at a right angle with the tooth surface. They point out that whereas the bevel may be necessary with the gold foil filling, where the foil is malleted against the actual margins of the enamel rods, such is not the case with the inlay, and the bevelling only makes a weak margin of gold, which later will turn away and expose a seam for the inroads of new caries.

There is, however, another method of fashioning the margin which is worthy of consideration. So far as your reporter has been able to learn, this method is original with Dr. M. L. Rhein, of New York, and has been adopted by only a few others. Yet your reporter has seen such beautiful results with this method that it seems important that it should be reported.

This arrangement must be called the "lapped joint." In treating the approximal surfaces, to which it especially applies, a chisel or disk is used between the teeth and the margins of the cavity trimmed away to a flat plane, and the trimming is extended until the entire bell shape form of the tooth has been removed. This yields considerable approximal space, and facilitates the taking of the impression of the cavity. It leaves the approximal margin flat, with the lingual and buccal margins in the same plane, which plane is slightly inclined away from the gum toward the occlusal surface. For fear that I have not made this entirely clear (which is difficult without models), let me further state that if we examine these flat approximal margins we will note that they are comparatively wide, with one angle formed by the surface of the margin and the buccal enamel surface, and a second angle formed by the surface of the cavity margin and the dentinal surface of the cavity. It is the extension of the inlay over this flat margin which accounts for the term "lapped joint."

This style of margin may be utilized with the direct method, but it is more readily used with the indirect, for the reason that the extreme buccal and lingual edges of the gold which makes the lap is brought to a very sharp edge, which is easily injured in removal from the mouth. Using the indirect method, the pattern wax is extended over the margins considerably, and this excess is polished off after making the cast, the polishing being carefully done with the gold inlay returned to the metal replica of the tooth.

Choice of Gold.

A very large number of prominent men, whose opinions must be treated with respect, have concluded that pure gold when cast is not sufficiently hard for filling teeth. To obtain a harder metal various alloys are used, probably the best being pure gold alloyed with from 2 to 5 or even 6 per cent. of platinum.

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In spite of the great number of men who have abandoned pure gold, and with all due respect to the opinions of my prominent confrères, your reporter is compelled by personal experience to proclaim his allegiance to pure gold, and he is solaced by the fact that he is still sustained in this opinion by the inventor of the method.

After using pure gold for about a year, your reporter observed some of the marring of occlusal surfaces and other troubles complained of by his confrères, and following their lead he used gold alloyed with platinum for about another year, and came to the conclusion that the greater difficulties in obtaining accurate adaptation more than offset the advantages of a harder surface. There is no doubt that pure gold can be more accurately cast than any alloy thereof, and consequently it should be some very pronounced advantages which would tempt us to forsake that metal.

Your reporter therefore abandoned the alloys and returned to the use of pure gold. By this time also he was partially awakened to the necessity of more accurately reproducing the occlusal forms of teeth, but later still he became fully aroused on this subject by the several communications of Dr. J. Lowe Young, and at the present time he unhesitatingly asserts that, if anything like accuracy is attained in reproducing tooth form and occlusion with the gold inlay, pure gold is the best metal with which to serve the patient, and that under these conditions it will be found quite hard enough to withstand all natural masticatory stresses. In other words it was the malformation and malocclusion of the early inlays rather than the supposed softness of the metal which occasioned the damages reported, which included everything from bruised surfaces of the gold to the splitting off of sections of tooth tissue.

Occlusion.

We come now to the most important feature of the entire gold inlay proposition. The natural teeth were given us for the mastication of food. They were undoubtedly made of a special design that they might adequately accomplish this function. In proportion as mastication is thoroughly well effected is the individual well or ill. Hence we may declare without opportunity for dissension that the health of a man is to a great degree dependent upon the occlusal form of his teeth, since upon this form must depend the efficiency of these organs in mastication.

In the past the occlusal form of molars and bicuspids have rarely been copied even in the crudest manner, with gold foil filling. Nor is it very practical to do this, carving the dense hard gold after it has been placed in the tooth. But with the gold inlay process, using as we do a plastic wax for forming the original pattern, the carving and reproduction of the actual tooth surface is only limited by the skill of the operator.

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This subject is of too great a magnitude to be thoroughly treated in a report of this character. Let me only say that a great awakening to the opportunities is even now occurring in the United States. Several enthusiasts are giving their time visiting dental societies throughout the country, explaining and exploiting the new doctrine. Already the spread of the movement is evidenced by an improved teaching in the schools.

Protection of Interproximal Soft Tissues.

I would be derelict, however, if I did not point out the most important feature of this most important new technique. It was long ago taught and later definitely proven by Prof. G. V. Black that actual approximal contact of the teeth is essential to the health of the interproximal tissue, and this is as true to-day as when the dogma was first promulgated. But in the light of the newer teaching we discover why it has been so often, in spite of accurate approximal contact, the gingival tissues have suffered, gingivitis has ensued, and too frequently septal abscesses have formed. We have wondered how food could have been forced between teeth so close together that it appeared difficult to pass a silk thread between the classically formed contact points.

This mystery is a mystery no longer. Normally teeth are movable in their sockets, and no contact of adjacent teeth will alone prevent the ingress of food where the masticatory stress of the individual is above the average.

A study of the dental organs in a state of health discloses the fact that one cusp of a molar tooth is received by the fossa of its antagonist in the opposite jaw, while the other antagonizes with a fossa formed by the inclined planes of two opposing teeth. In the first instance we find that the summit of the cusp, as it reaches the bottom of the fossa of its antagonist, is met by a cross sulcus leading lingually and buccally, so that the food crushed at this point is forced in the direction of this sulcus. Where the cusp antagonizes two teeth we find each of these opposing teeth protected by a marginal ridge. This marginal ridge has its inclined plane leading toward the centre of the tooth and consequently away from the interproximal space. Moreover, at the extreme depth of this incline we find a crescentic groove or sulcus, the horns of which pass outward and inward, buccally and lingually, so that food crushed at this point is forcibly ejected away from rather than toward or into the interproximal space.

Your reporter is quite ready to admit that this condition is not prominently present in all teeth nor in all types of teeth. But by a study of the best type of teeth shall we learn the protective intention of Nature in this provision. So important does this point seem to your reporter that he makes an earnest appeal, not only for the restoration of the

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occlusal surfaces of molars and bicuspids, in as exact accordance with nature as possible, but he would urge that the mesial and distal marginal ridges, with their inclined planes and crescentic sulci, be accentuated even to a greater degree than they may exist in other dental members of the same mouth. When we consider that the tooth is already in a state of disease, we cannot take too many precautions to protect it from a new attack.

It is your reporter's belief that much gingival disease has been inaugurated by flat fillings, which have had a tendency to force food into rather than away from the interproximal spaces. Such fillings, while they may have saved the teeth, have injured the tissues of the mouth by packing food against the soft tissues, and have injured distant organs of the body by burdening them with an excessive share of the processes of digestion. All these troubles may be avoided and the patient's masticating apparatus may be perfectly restored if we conscientiously utilize the opportunities afforded us by the cast gold inlay process.

Inlays for Difficult Positions.

In conclusion let me describe three types of inlays which have been formulated for positions of special difficulty.

First picture to your mind a distal approximal cavity in a molar, complicated by the presence of a cavity at the buccal aspect, near the gum. The tooth substance between the two cavities may be so poor that a thorough excavation would make the two cavities continuous. This is a condition in which it is manifest that a single inlay cannot be used. The procedure is as follows: An inlay is first made for the buccal cavity and is finished and set so that one edge of it becomes a part of the margin of the approximal cavity. A second inlay is made for the approximal cavity, and when set completes the operation. If well done it will seem to be but one inlay.

In the so-called M.O.D. cavities it is common practice to fashion an inlay for the distal and half of the occlusal part of the cavity, cutting a box or dove-tail in the occlusal extension. This is set and a second inlay is made for the mesial portion of the cavity, interlocking with the first inlay when set. As has been already stated, this procedure is seldom requisite when the M.O.D. cavity presents at the outset, but it is an important technique when a cavity appears in the approximal part of a tooth which already carries an inlay in the other approximal surface, seated and anchored in the occlusal surface. In such cases an interlocking of the two inlays assures permanency of both.

With the first introduction of the gold inlay attempts were made to produce an inlay which would have its conspicuous surface covered with porcelain. Many methods were tried, but none has seemed so satisfactory

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as a method recently shown and now much utilized in the United States. This method even permits the use of a gold inlay in the anterior teeth. The procedure is to make a gold inlay of such form that all that part where strength is required shall be of gold. Such part as would be easily seen is cut away from the wax pattern and a box formed, one edge of which shall be the margin of the tooth, the box, of course, only appearing as a box when the inlay is set. After setting the inlay this box is filled with a silicate cement to match the tooth. Such combination inlays having been made, it was discovered that the beautiful transparency of the cement was lost by having the gold back of the filling, but in the more recent inlays of this character this fault has been largely overcome by cutting windows completely through the gold. These windows afford a better hold for the cement, and by permitting the passage of light restore the translucency.

Respectfully submitted.

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Central Dental Association of Northern New Jersey

Discussion of Dr. Corwin's Paper.

Edward C. Kirk, D.D.S., Sc.D., Philadelphia.

Mr. President and Gentlemen of the C. D. A.: I feel very much embarrassed by the handicap the President has placed upon me, I am afraid it is going to be something like the mountain laboring and bringing forth a mouse. I want to say, however, and I am sure this expresses your own thoughts, those of you who will not have the opportunity to speak, that I feel that I owe a debt of gratitude to the essayist, not only for bringing to our attention this very important question but for the very comprehensive way in which he has treated the subject.

We, all of us, know or we will find from experience, and a very unpleasant experience, what a very important thing this question of fetid breath is. Leaving out all questions of pathology and the tremendous handicap that it is to the individuals who are cursed with a fetid breath so often without their own knowledge—we know what suffering they inflict upon others with whom they come in contact. I think we can all recall to mind individuals, attractive or important in various ways, that it is really an unpleasant, not to say disagreeable, experience to meet because of the exhalations that emanate from their bodies, and particularly from the mouth cavity. So leaving out all questions of pathology

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it is an act of mercy to take up the study of this matter carefully and scientifically to see what can be done for the relief of the conditions.

A very prominent gentleman, a man who would be known to probably all of this company if I should mention his name, was a patient of mine for many years—a delightful character, a man of international reputation; I considered his visits to my office red letter days, and he used to say to me: "Now, boy"—I was a boy then—"there is one thing I want you to promise me, and that is that you will be sufficiently my friend, to tell me when I have a bad breath." He said: "There are so many old men, men who as they grow old develop offensive breaths, and I want to be preserved from that, or if I cannot be preserved from it, I at least want to know when it happens, and you are the only one I know who can tell me about it." Fortunately for him, and his sensitive feeling about the matter, he never did develop a bad breath; but it is true we are constantly meeting cases of that sort, and I have always felt that something ought to be done for them, and, within the limits of my practice I have done all that I could for them and given some attention to the matter from the standpoint of the mouth as related to a fetid breath.

I will report a little instance that occurred in my office that may be somewhat humorous, but I hope that it is not very humorous. A lady came to my office one time followed by a very beautiful, prize winning, setter dog, and I placed her in the chair and proceeded with the work that was necessary for her. I noticed this dog running around the room and after awhile he began to rub his head on the carpet and roll around on the floor just as dogs will do when they run across carrion or putrid flesh. You all know how attractive putrifying flesh seems to be to a dog, and he was rolling on the floor in this characteristic way and I wondered what on earth he could have found in my office to develop that characteristic. I was so curious about it that I went and examined the place and there I found a tooth on the floor. An hour or two previously I had extracted a number of very loose pyorrheal teeth from a patient and one of them had fallen on the floor, and this dog had discovered it and detected the odor of putrifaction, and it brought about that peculiar conduct on the part of the dog. He discovered that was a case of putrifying tissue and it appealed to his epicurian sense and he expressed his pleasure over the discovery by this very characteristic conduct.

The odor of putrifaction we know develops in the case of necrotic destruction of the tissues about a tooth, certainly in those cases that we speak of as pyorrheal. That is one of the very common sources of fetor of the breath. We find that condition, not only in pyorrhea, but we find it in mechanical dentistry too. A patient walked into my office many years ago and he said: "I want to show you a piece of work I have in

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my mouth. It is the largest piece of work of the kind that has ever been done up-to-date in this country." And I said: "Well I can tell you what it is before you open your month." And he asked: "What is it?" And I replied: "It is a piece of crown and bridgework; I can smell it" (laughter). He said: "Do you mean that?" I said: "Yes, I smell it now." It was done by a very famous crown and bridgeworker who has since passed away—I mean of the advertising sort—one of the pioneers who had helped to introduce that method. The patient had an entire upper denture of bridgework and beneath this denture was a septic condition, a necrotic condition, affecting the tissues about the roots that were used for abutments and I could smell it within six feet before he told me about it. So those are sources of breath contamination, distinctly within our own control.

Mouth Hygiene. We hear a great deal about mouth hygiene and we hear that "A clean tooth will not decay." A great deal of the mouth hygiene we hear about and which is exploited, is not mouth hygiene at all, it is tooth hygiene. That is to say it is carried out on the principal expressed in the axiom. "A clean tooth will not decay," and we clean the teeth and after we have gotten them clean we stop. But that is only tooth hygiene; there are other things there besides teeth. There is the mouth and its contents.

One of the sources of breath contamination that is a very potent and active source of it, is the putrifactive activity that takes place upon the dorsom of the tongue simply from an unclean tongue—the accumulation we so frequently see on the floor of the tongue, especially towards the back of the tongue. I gave a lecture on mouth hygiene not long ago. I preached the gospel of oral cleanliness and mentioned incidently the contamination of the breath that came from an unclean mouth, and an old quaker lady, when the meeting was over, came to me and said she didn't feel quite sure that this breath contamination I talked about had so much to do with the mouth, that it frequently came from the stomach. and she said she had seen her doctor about that, and he told her that it came from her stomach. I looked at her mouth and it was filthy. I had to hold my breath while I looked at it, and I said: "You go back to your doctor and tell him you have had this disagreement with me and tell him I think it is possible, indeed highly probable, that your stomach trouble is the result of your mouth contamination, that your mouth contamination does not result from your stomach trouble." She said: "I had not thought of that." I said: "That is worth thinking about for with your infected mouth you are constantly swallowing untold myriads of bacteria and putting your stomach out of order by swallowing the in-

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fected food passing through that cavity, so that you have the cart before the horse somewhat?"

I do not think it is necessary nor worth while for me to go over the instances that occur in our own work which corroborate the statements of the essayist with reference to diseases of the sinuses and the nasal cavity, the tonsils, etc., that we see from time to time. That I think we fully appreciate and much of it, indeed all of it now, we refer to specialists in those departments for treatment.

We have all seen those cases and know about them.

Care of the Tongue.

One of the points about tongue infection that I did not fully elaborate, and that I want to speak about is this: in our normaly or ordinarily cleanly mouths, in the mouths of healthy people, in those whom I have spoken about as being given to the cleansing of the teeth, these people are liable to have a contaminated breath from that source, so that my own practice and teaching in reference to those who are dependent upon me for advice and those who come to me for instruction in that connection is that not only should the teeth be cleansed, but that the dorsum of the tongue itself should also be thoroughly cleansed before retiring at night. Some individuals have a habit or a tendency to sleep upon the back and in that position the mouth is likely to be open; many people who snore do so with their mouths open. I have heard it said that is impossible, but I have sat up and watched it; so I know it is possible (laughter). With the open mouth, breathing through the open mouth, and with these accumulations upon the dorsum and the tongue and with the salivary secretions for the time being arrested, putrifactive changes take place in the accumulations on the back of the dorsum of the tongue and the patient wakes in the morning with a disagreeable taste in the mouth and certainly a disagreeable breath. I have seen that occur in individuals who were perfect specimens of health—that peculiar putrifactive taint of heaviness of the breath that is noticeable in many instances where you find these accumulations in the back of the tongue where the secretions are more or less arrested at night and where the washing of the tongue by the salivary fluid does not take place.

With regard to the cleansing of the tongue, it should be done mechanically with a brush or with a tongue scraper; and I want to add my word of approval to the suggestion the essayist made with reference to the use of hydrogen dioxide for that particular purpose. My own practice which I recommend and use personally in my own family is to use a preparation of about twenty-five per cent. of hydrogen dioxide and seventy-five per cent. of lime water. The lime water neutralizes the

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slight acidity of the commercial preparation of hydrogen dioxide and we have in the limewater the alkalinity that acts as a solvent to the mucous which helps to hold those secretions on the surface of the teeth, of the dorsum and of the tongue.

I was particularly interested in the classification given by the essayist in regard to his comments on the source of breath contamination and also his comments on the chemical aspects of the question.

We have learned by long experience to avoid those things which have certain kinds of odors as being harmful or offensive to us, just as when we detect a certain odor on the country highway at night and diagnose it as a skunk we give it a pretty wide berth; and the same principal applies, to those things which experience has shown us to be harmful, and that is the basis of our attitude toward the question of odors, as to whether they are agreeable or disagreeable, largely. So we are liable to avoid those odors which are characteristic of putrifaction because we know such things are harmful to us. Speaking from experience I had a case which taught me a great lesson. I went over to our bacteriological laboratory one morning to consult the director there, Dr. Abbott; he was quite busy and I wandered into the chemical storeroom adjoining his office and looked over the chemicals, because I was interested in the collection and in a little bottle holding about a gram and which was labled "Katol." I became rather interested, for I had run across Katol in a very dilute form and knew something of its origin and I thought I would like to see what real Katol smelled like. I am not exaggerating when I tell you that when I took the stopper out of that small bottle—(I was raised in a chemical laboratory, and I learned long ago not to stick a bottle under my nose) after the technique of the chemist, and got it in a milder form—pardon me when I tell you that if a putrified corpse struck me a blow in the face, I could not have had a more painful sensation. It was a peculiar thing, it has the effect of a solid blow; the sensation was so intense that I felt as though I had been struck in the face. So that, Sir, concerning the discourse you have given on the density of certain smells, this must have been the densest one of all.

I have spoken in a very desultory way because I know nothing at all about the subject, but I again wish to express my gratitude to the essayist and my appreciation of Dr. Kussy's very kind introduction and to Dr. Waldron who sent me a stand and deliver order to be here tonight (applause).

Henry Clay Ferris, D.D.S., of New York.

I must confess I am very much overawed by your President's complimentary introduction, and feel that he has made my task the greater by causing you to expect too much of me in this discussion.

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Had I the ability to express myself in the beautiful language that flows so easily from Dean Kirk's mouth, I might feel a great deal more at ease, but I will try to give you some of my personal experiences in an effort to discuss Dr. Corwin's interesting paper which contains so many fine points that it is difficult to know where to begin.

He first refers to normal breath. The expired breath is nitrogen and oxygen, the proportion of the latter less than that present in the atmosphere, 4.78 volume per cent. of carbonic acid, aqueous vapor of ammonia and organic impurities. The external cold increases the intake of oxygen and the discharge of CO_2 while a rise of external temperature, is followed by a diminution of both. Muscular exercise acts like cold. Food produces the same result. Fasting lowers it. In the case of "Ceth" the fasting man, the absorption of oxygen and the discharge of CO_2 per kilo of body weight, fell rapidly. Before it was seventy-three per cent., and on the third day it was sixty-five per cent. Vegetable food raises the respiratory quota to nearly unity while flesh diet is about seventy-two per cent., and on mixed diet somewhat higher.

Among the curiosities of literature, there are reported cases of luminous or bright red breath and others of inflammable breath in which there was a flash from holding a lighted match near the mouth.

In health the breath is nearly odorless, but a sweet odor from certain glands in the mucocutaneous junction of the nostrils is emitted, and nature has designed this as a sexual attraction and with other attractions between the sexes it helps to insure reproduction of the species*

Every person is characterized by his own odor and the more refined he is, the higher in the scale of civilization, the more delicate the odor. On the other hand, negroes emit a musty odor probably due to the formation of combustible carborated hydrogen from chemical decomposition of the breath.‡

In uremia the breath acquires ammoniacal odors due to the non-elimination of the urea which persists in the blood and combines with water to form carbonate of ammonia. The skin also exhales the same odor.

Various mineral substances which are introduced into the system and are odorless, produce odors of the breath during some periods. This occurs in stomatitis and some other disturbances of the digestion due to chronic poisoning. Substances concerned in the production of toxic halitosis and antimony, arsenic, lead, mercury, phosphorus and sulphur. Sulphur imparts a distinct odor, after two hours, to the breath and perspiration. Those not in good condition for reproduction or lacking in

*Emma E. Walker's Reference Handbook of Medical Science Vol.II
‡Green's Encyclopedia

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passion, possess slight nasal odors. It has been stated to be absent or disagreeable in pregnant women. In diabetes the breath has a sweetish odor likened to honey, sweet apples or hay. Sulphurated hydrogen is found in the stomach and intestines and excreted through the lungs.

I would next take up the classification the essayist has used, and in my review of the literature there was none so comprehensive. I would like to suggest that he include that of particular interest to our field—the odors of secretions of the oral cavity. The normal production of saliva being forty-eight ounces in twenty-four hours or about fifteen hundred cubic centimeters is not considered by any of the writers nor has it been touched in this essay. It is my experience that in all cases given in his first class, those exhaled from the blood and resultant from pathological conditions in the alimentary canal are distinguished in the specimens of saliva collected from the different patients. I have not collected saliva with the use of a catheter or any mechanical device and am unable to state that these odors were not produced partially by the accumulation of gases passing over them while in the oral cavity, but I am of the opinion that they play a very small part in the estimation of the odors that are emitted from the salivary specimen. These odors are characteristic of lesions in the alimentary canal and are associated in differential degrees in diabetes, nephritis, and obstructions of the alimentary canal. In the nerve diseases they surpass all other odors that we find in putrefactive cases. In insane asylums the odor is peculiarly obnoxious, and while they scrub these patients with soap twice a week and the water runs away polluted, they remain sweet but a very short time.

Some of these cases have been treated through salivary analysis by Dr. Bernard R. LeRoy, of Athens, Ohio. Where the sulpho cyanate of potassium was absent in the saliva, he administered this drug in the form of sulpho cyanate of sodium, and claims to have reduced the odor materially by this treatment. His explanation of the physiological action of the drug is that it influences the metabolism of the tissue cells, stimulating them to normal function and retention of the carbonates.

To go back to the dental side of this subject, let me introduce some of my methods as an orthodontist in that direction. We find that these pathological lesions which occur in the intestinal tract are controlled to a large extent by a proper consideration of mastication in normal occlusion of the teeth, that is after the normal occlusion of the teeth has been accomplished. It is my practice in all cases of malocclusion, in estimating the value of the organ from the tooth standpoint, to reduce the organ to a masticating machine, counting the number of inclined planes of the teeth in occlusion, and in proportion to the number of teeth in

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occlusion, or to the number of inclined planes taking the normal as one hundred and thirty-four, so we will find a betterment in the hygienic conditions of that oral cavity regardless of the cleansing or hygienic methods that the patients may carry out in their daily routine.

I have had the pleasure of working out a correction of chronic constipation after two years work and a year of tests, and of curing the patient where medication failed to be of any service. I scientifically reported this case in *Dental Cosmos* a couple of months ago and I consider it one of the best illustrations of the value of normal occlusion and its effect upon the whole alimentary canal. The patient's bowels have been regular for the past year, and that has been accomplished by bringing the number of inclined planes in occlusion up to eighty-five from twenty-two, and those inclined planes after an orthodontic operation were re-established at the hands of a dentist in building up by cast gold inlays, with careful consideration of the normal form of each tooth.

Treatment.

As far as medication is concerned, it is my observation that the best men in New York are treating their cases from the standpoint of dietetics. Antiseptics are being relegated to the background. They are analyzing their subjects, particularly the wealthy classes who can afford to pay for these analyses, and in the hospitals they are chemically treating their patients through dietetics. I have had the pleasure to save six youngsters under four years of age after four had died, one with the superior maxilla and part of the nasal bone necrotic and the face practically eaten away. I saved the six in this simple manner. I received them with a temperature of one hundred and three and one-half, and an eruption all around the mouth and nose, and simply treated them with a normal salt solution locally and lime water such as Prof. Kirk has referred to. I find that in my practice almost a panacea. It dissolves the mucine and albumen in the mouth as nothing else will, that I have been able to find either actually applied or in experimental work in the laboratory. I gave these children inch-squares of dried bread with no butter. The bread which they at first refused, was left within their reach. The teeth were all evacuating pus and blood and were so loose they were bobbing around in their little heads. The head nurse said she did not believe the children would use this dried bread, but I told her to stick right to it, and to hand the children a piece of bread every time they cried, which she did, and they started to nibble at it, and after a while they would eat as much as half of a piece, and in the course of a few days I got them up to two or three pieces of this bread, thereby increasing the flow of saliva, the carbon hydrate food coming into their

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mouths in a state which would absorb the saliva and give the largest amount of digestion, also stimulating by reflex, the gastric and pancreatic secretions. The loose teeth began to be firm in the mouth, the pus disappeared, and after three weeks we discharged those children cured. I consider that particular experience one very potent to all dentists, and the same principle can be used in a little higher grade of disease. It illustrates a principle in the general practice of medicine as well as in the practice of dentistry. You will find that in most of your cases of fetid breaths, you can accomplish some results—you can work your bread! You can also work a little rubber block and make a patient with a sore tooth exercise that tooth with the rubber block, and in that way you will stimulate and increase the flow of salivary secretions, which is Nature's antiseptic, and according to the principle expressed by our essayist.

The subject is so full that I wish I could go on, but fear that I am boring you somewhat. The thought is one that we should follow out and give a good deal more attention to in our daily practice, and I wish to thank the essayist for directing my attention to the subject.

Dr. James Spencer Brown.

There is one angle of this discussion that has not been touched upon and which comes under the work of a surgeon and may be of a little interest to you in the classification which Dr. Corwin gave of odors arising from systemic affections. The odor of the breath, of course, is the end result just as gall stones and ulcers of the stomach are the end result of some changes in the body metabolism and in speaking of these systemic affections, intestinal stasis, I believe, plays a most important part. The newest thing in medicine to-day is *intestinal stasis*. Physicians have treated it for half a century with absolutely no results, and now the surgeons are taking a hand at it. Do you know that if you cut off the intestine about twenty inches from the stomach the patient will grow fat—in fact you do not need all your guts, you merely have them by the mercy of God.

Sir Arburthnot Lane, of Guy's Hospital, London, several years ago, began to study the effects of intestinal stasis. You know that Metchinkoff and his followers attributed all absorption of toxins to the large intestine and now Lane seems to have proved that the colon plays a very little part. He has in numerous operations proved that in almost all of these cases of intestinal stasis where the fetor of the breath is the end result, cases are cured by short circuiting the illium into the sigmoid flexure of the colon. Insane people who have been spoken about all stink because they have intestinal stasis; their skin and breath smell bad, they are

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obnoxious. As a rule those who suffer from intestinal stasis suffer from it through mechanical causes. This is proven—it is not a question of theory. Anyone who will take the trouble to do enough belly operations will see that it is so.

We have done much of this work in recent years and it would be surprising to some of you gentlemen to see people that have gone through the hands of different men looking for a tag to attach to them in the way of a diagnosis. Of course, they must have some kind of a tag attached to them in the way of a diagnosis, and most of them have "Neurestheníà"; that seems to be the sin that besets them more than anything else and it means "We don't know what's the matter." (Laughter.)

Some of these neurestheníics suffer from toxemia from intestinal stasis; after they are short-circuited they grow fat and well and healthy and become useful members of society and do not have any more neurestheníà.

It is a very interesting phase that has swept over the medical profession. As you know Sir Arburthnot Lane was the first man to introduce salt solution into the veins, which was fought by the Royal College of Surgeons in England, and opposed so vigorously by the Society of Physiologists of England because they said it always killed the animals; still he continued to put it into human beings, until now, in cases of shock, if you did not introduce it you would likely be charged with being guilty of malpractice. This same man called attention to the fact that most deformities in the fractures were caused by the bad setting of bones, and until we had the X-Ray to show that it was so, he was again fought by the whole profession in England, and now I suppose it is one of the most common propositions put up to the surgeons- I am sure it is with me—this plating of fractures of the long bones.

The latest thing that he has proposed is the surgical treatment of intestinal stasis. About five years ago he commenced to short-circuit people and take out their colons and the profession thought he was crazy. Last month he was at the Chicago Convention of Surgeons, and when he came on to New York Dr. Bainbridge gave him a dinner party at the St. Regis—I am telling this as a matter of history and you probably will be advised about it in a few weeks. The dinner lasted until half past ten and then some two hundred and fifty surgeons stayed there until half past one or two o'clock fighting this matter out with him and he won.

I believe the day is coming when these cases of fetid breath—which is just the end result and not necessarily a disease—will be treated by surgeons and they will be cured just as we cure appendicitis, for it is

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not a difficult operation nor fraught with much danger. Out of at least one hundred and sixty cases operated upon in England there were three deaths, two from sepsis and one from pulmonary embolism.

This is the angle that I desired to speak about. I am very much obliged to Dr. Corwin and to Dr. Ferris and to your President for allowing me to speak. Thank you.

Dr. Corwin. (In closing the discussion.) I am very glad I came to this meeting. The discussion has developed a great many aspects of the case beyond those I presented this evening, and in which I was profoundly interested, and I beg to thank the gentlemen who so kindly discussed—or I should say—who have added to the paper. I certainly cannot say a word to add to the emphasis which they have given to the aspects of the case they have so magnificently presented.

I was especially interested in the remarks Dr. Ferris made from the standpoint of the orthodontist. I have had much pleasure in following up some of the discoveries and advances made along the lines of orthodontia and I do not know that the influence of orthodontia upon such apparently remote conditions as constipation has ever been brought to my notice before.

I am sorry that the paper is defective in a great many respects; I have not considered very much the oral causes of bad breath, knowing that would appeal immediately to you, and you would doubtless investigate it with a great deal of care. In fact I have not at all perused the dental literature in gathering material for this paper. I thank you gentlemen most heartily and assure you the discussion has been of much profit to me.

On motion a vote of thanks was extended to the essayist for his very excellent paper and to the gentlemen who had so ably discussed the same.

On motion, adjourned.

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Wholesale Extraction of First Permanent Molars Recommended to the New York State Department of Health.

The propaganda of mouth hygene has reached that satisfactory stage where the dental profession is receiving hearty co-operation from the medical profession, from school boards and from health boards. The importance of proper inspection and proper care of the teeth of school children has reached that period of recognition where dentists have been emboldened to suggest that boards of health might well include one dental member, and such appointments have been made in a few notable instances. It will therefore be with some chagrin that the profession will learn that such a letter as we publish herewith could have been addressed to Dr. Herman M. Biggs, State Commissioner of Health for New York. Fortunately, Dr. Biggs is too well informed to have acepted the advice as sound. However, he thought it well to send copies of the letter to a prominent mouth hygienist of this state for his opinion and for the opinions of others. In this manner it reached the editor, and permission to publish has been obtained from the Department of Health, that the subject may be even more widely discussed should it seem worth while. The writer of the letter in question is unknown to us, and consequently its publication is entirely without bias.

Letter to N. Y. State Commissioner of Health.

"There is one thing I would like to mention to you in regard to the health of children in the public schools, and that is, the advisability of removing the sixth year molars.

"About 95 per cent. of all children are better

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off without these teeth. This conclusion is reached after having practiced dentistry for thirty-eight years, and after having removed these molars for at least 15,000 children in private practice with the late Dr. Ferdinand Hasbrouck, of New York City, for whom I was operator for seven years. This practice produces wonderful results and should usually be done between the ages of ten and fourteen; in the majority of cases at the age of twelve. I have always considered it one of the curses of childhood to allow these molars to remain in the mouth and cause so much crowding and irregularity and subsequent unavoidable decay.

"I have some beautiful examples of this practice right here in this town which I could show you at any time. Nature provides us with more teeth (also more lung) than we really need, and as the sixth year molars are usually no better than temporary teeth in quality, they fall an easy prey to the ravages of decay and filthiness in the mouth, and cause a great amount of pain and ill-health.

"If this practice could be carried out with the children requiring it in this State for the next ten years alone, twenty-five per cent. of the present number of dentists now practicing in the State could easily attend to all of the necessary dental operations twenty years from now, and the health of the patients would be far superior.

"As a letter is a small space to say much on such an important subject, I simply submit this as a hint to some of the future dental inspection work in the schools. In a personal interview I could remind you of many important steps to be insisted upon in this matter.

"Respectfully submitted,

"_____"

A Digest of the Extraordinary Statement.

This unknown writer declares that he has had thirty-eight years of experience during which time he has extracted the sixth year molars for at least fifteen thousand children. That means that for thirty-eight years this gentleman has extracted the sixth year molars from about four hundred children annually, or about two children a day for two hundred work days of each year. It also means that he has extracted sixty thousand first permanent molars from the mouths of children because in his opinion "ninety-five per cent. of children are better off without them."

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He states that he considers it "one of the curses of childhood to allow these molars to remain in the mouth and cause so much crowding and irregularity." What will Angle, and Case and Jackson think of this? Here is a somewhat new factor in the etiology of malocclusion, and a short road to its correction.

He likewise announces that these teeth are "little better than temporary teeth in quality and fall an easy prey to the ravages of decay." What will Prof. Black think of that?

Most interesting of all, the gentleman declares that he has some beautiful examples of the practice which he could show. Surely after such extensive experience with this advocated practice he certainly should have cases to exhibit, and since he has expressed a willingness to show these cases to the Health Commissioner, he should be equally willing to submit his evidence to the dental profession. And since he prophesies that if his suggestion were carried into effect the number of dentists needed in the community could be lessened by seventy-five per cent., his proposal is rife with such tremendous results that we all would be interested in his arguments.

He is therefore cordially invited to prepare for publication in ITEMS OF INTEREST a full statement of his theories with evidence to substantiate his claims.

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IN THE LAST NUMBER, my friend from Kentucky asked a question, which is here repeated that the topic may be fairly before us. "We have had articles," said he, "on office management, efficiency, and business talks. But what has been printed on various means of establishing a practice? Why withhold such knowledge from the worthy young man, and leave him by bitter experience to get through and around the pitfalls that he is sure to encounter?"

THAT IS THE QUESTION, and I promised to answer it.

WHAT WOULD YOU think of a man who jumped into the sea, and then cried out: "Ho, there! Some one jump in and show me how to swim!" Would you not consider that he was a bit late in recalling that he who plunges overboard should have previously provided a means of survival when he found himself in deep water?

YET IT IS undoubtedly true that this is exactly the situation in which all too many young dentists find themselves immediately after graduation. Daddy goes to a dentist and has some bridgework done, and when he gets a bill for $12,576.75 he concludes that dentistry is a "paying business," and he sends Son to a dental college.

AND WHEN SON ascends the white marble steps of the Dean's Palace and announces that he wants to matriculate, does that Dean ask the boy: "Have you any idea how you will get a practice after you get your sheepskin?" Yes he does—not! But if some day some Dean should ask such a question, what would Son say? He would admit that the question had never occurred to him, and that he did not know the answer.

FACT IS business men's sons have no right to attend dental colleges at all. Dentistry is not a business, though, of course, a practice should be managed in a business-like manner. Time was when a medical man never sent out a bill, or if he did it was sent in blank; merely a gentle

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hint, or reminder, and the G. P. (grateful patient) would straightway write out a nice little check and forward it to the Dear Doctor. This was called an honorarium. But after a time some patients abused this honorarium method of settlement with doctors, and the method began to grow unpopular—with the doctors.

SO NOWADAYS doctors, and likewise dentists, send out bills, with the service fee written in plain figures, and really it is just as well as things are, because so few would know what an honorarium is, any more than a friend of mine who asked me if it was not a new idea to declare a "natatorium," as so many countries have done during this war. But even so, while it is perfectly just, proper, and right to have fixed fees, and to collect real money for services rendered, nevertheless dentistry is not, or, at least, should not be looked upon as a "business."

THEREFORE A YOUNG man entering the profession should do so just as he would join a Masonic order; not because of what he might get out of it so much, as with the full intention of being an honor to the honorable body with which he thus associates himself.

CONSEQUENTLY SINCE he elects to become a professional man, he should realize at the outset that he is in honor bound to abide by the rules of the fraternity, and that an infraction of these rules is more of a disgrace to himself than to the brotherhood whose tenets he has promised to obey. Yet how often, at the very outset of his career does the young graduate take a step which is likely forever to ostracize him from the company of the best of his professional brothers, and all because in advance he neglected to ask himself: "How shall I get into practice?"

A FEW YEARS AGO a young man came to me seeking a position. He told me two things that were astounding, considered together. First that he was a graduate of one of our best university schools. Second that he had been employed for a year in one of the most notorious dental parlors in the city. "Were you not taught in College," I asked, "that the majority of these dental parlors are pernicious, and that no professional man can be connected with them?" This he admitted, and then I asked: "Why have you worked for such people, prostituting your profession, your Alma Mater, and yourself?" This galled him and with a little heat he replied: "I had to live!" Like a flash I retorted: "I do not admit that. You do not have to live, or, at least, not at the expense of dentistry. Men like you might better die than live."

HARSH AS THAT may sound it is as sound as Gospel. Before a man enters an honorable profession, before he applies for and accepts that education which could not be transmitted to him but for the text books and teaching of truly professional men, he should study out the problem of how to use his professional education, in a professional manner.

OF COURSE, to the Son of a successful dentist there is no problem as to

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entrance into practice. He will first assist and then succeed his father. To the Son of the business man who essays to become a dentist for "what there is in it," I have no advice to give. To the young man who finds occupation in a dental office in some capacity, and finally, growing to like the work seeks the required education; or to any young man who, with his eyes open to the fact that a profession is no high road to fortune, but who from natural predilections, wishes to be a professional man rather than a tradesman, I cheerfully offer a few random thoughts.

AT THE VERY OUTSET let me say that the acceptance of the position of assistant with an older man is like a double-edged sword. There are advantages in such an alliance, but there are serious drawbacks. If the older man is skilful, the younger man may learn much from him, but do not overlook the fact that the possession of a large practice does not necessarily attest either to practical ability nor professional attainments. There are "business men," even in the higher walks, masquerading as professional men, and I might add, masquerading as dentists. Men who are just natural born salesmen. Such men "sell" amalgam fillings under the name of platinum, "which, as you know, is very expensive just at present." They speak of the silicate cements as "the new seamless porcelain fillings." And their gold fillings are seven-eighths oxy-phosphate to "protect the delicate pulp from thermal shock." In such offices pulps are "capped" so as "to preserve the vitality of the osseous structure of the tooth as long as possible," and fistulous openings from alveolar abscesses are "an advantage since they afford free drainage from the gum boils."

BUT EVEN IN the offices of the best grade of dentists, offices in which the young man may undoubtedly learn much, there is a limit to the advantage of such association. Let the young graduate realize that finally he must establish a practice for himself; one in which the patients owe allegiance to him, and not to another man. His inexperience and lack of faith in his own judgment may hamper him at the outset if he embark alone, but if he have average or more than average ability the satisfaction of his patients will rapidly give him confidence, and from that moment he must be increasingly successful as a practice builder. Then why build for another man? I place the advisable limit of such an association at five years, and three might be safer.

IN FORMING an alliance, the most important clause in the contract should be to the effect that "at the end of the term of this contract the party of the second part shall be at liberty to enter into practice for himself, and to work for any patient who may have been placed in his charge by the party of the first part, provided such patient may seek such service unsolicited, except that the party of the second part by mail to all such patients a card announcing that he has terminated his association and has removed to his new address."

SUCH AN AGREEMENT made in advance, would avoid much possible ill-

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feeling, and prevent enmities such as have lasted through life. The older man will place a family in the care of his assistant; usually a family for whom he does not himself wish to work. This family from a purely business standpoint is the "property" of the older man. Being pleased with the young man's services a friend is recommended. This is the nucleus of family No. 2. Also the "property" of the older man. But if the young man continues to give satisfaction he will acquire family No. 3, and then No. 4, and then No. 5. All of these the older man would consider as his because had he not placed family No. 1 in the care of his assistant he never would have seen nor heard of family No. 5. This fact being true, argument is futile. On the other hand the young man declares that if his work had not been satisfactory to numerous intermediate patients the older man never would have seen nor heard of family No. 5. Which is not entirely true, because the same result might have come about had the older man kept family No. 1 in his own personal care. However, this is sufficient to show how easily an estrangement and even an animosity may arise, which will harass for a lifetime.

CLEARLY IT WOULD be best to permit the patient to decide to which man he owes allegiance, and therefore the clause suggested, or its substance should be in all contracts between old and young dentists. Indeed it is of more real lasting importance than the salary.

WHERE A YOUNG man begins as the associate of another, when he terminates his agreement he should have a nucleus of a practice, especially if he had reserved the right to receive patients himself on some terms agreeable to both parties. Let us now come to the young graduate who courageously opens an office on his own responsibility. Such a man should join the local dental society as promptly as possible, and to render this easier, the Society should remit part of the first year's dues to all who become members during the first year of practice.

HAVING THUS proven his intention to practice ethically, he should, as far as possible, without unduly intruding himself, cultivate the friendship of the more prominent and successful men, though all professional friendships are of value. If there be one line of work in which the young man especially excels, let him exhibit such work to the older man. Ask permission to take a patient to the office of some man who may have shown some friendly interest, with the avowed intent of receiving criticism. In this way the older man will be enabled to see exactly what quality of workman the younger man may be. If pleased, he will probably send him practice. These older men are constantly being asked by patients: "Can you recommend a young man who does good work? I have a friend who cannot afford your fees?" How can the older man conscientiously recommend a younger man whose work he has never seen?

THIS BRINGS US naturally to the question of fees. Let us for a moment consider what the business man, the shop-keeper would do. Before

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even opening his doors would he not take account of stock, and estimate the price at which he must sell? It is even more necessary for the professional man to do this. There is nothing harder to accomplish than an increase in fees. Patients whom you serve well at the beginning of your practice, at fees below the value of your services will never leave you, and will expect you to adhere to the established fees sometimes throughout a lifetime. All old practitioners have "old families" of this class for whom it has long ceased to be profitable to work.

THE YOUNG PRACTITIONER should therefore determine the value at which he would be willing to serve his patient for at least ten years. It will be better to fix it a bit high rather than a bit low. He should endeavor from the very outset to avoid appearing so eager for patronage that he will work at any price. A reputation for cheapness spreads rapidly and is hard to overcome.

ALL PEOPLE are bargain hunters. From the very outset cultivate the habit of explaining that you are not a "cheap dentist." The patient will ask for some idea of your fees, and if acceptable you are at once obtaining a client who will pay you your full fee. Too many young men through timidity or lack of appreciation of their own ability present bills for less than the patients really expected to pay. Remember that in such cases the patient not only does not pay more than is asked, but he is apt to value your service at the lower price you put upon it.

I HAVE SAID that all people like a bargain. How may we take advantage of that, and accept a low fee without depreciating ourselves in the eyes of the patient? The answer to this is almost the most important advice I have to give to the man entering practice. Let us suppose that he has decided that for the first ten years he should receive an average fee of six dollars per hour. To a new patient he should make this clear. If the patient doubts her ability to pay so much she will express this doubt and then ask: "Could you give me an idea as to what the work will cost?" The young dentist must then make this estimate, being sure that he is fair to himself. Let us say that he offers to do the work required for one hundred dollars. The patient is aghast, and says she cannot possibly pay more than fifty dollars. The dentist then may say: "I have given you a reasonable estimate. The fee is really lower than some of the older men would charge. Still, among professional men there is no definite fee, and we do not feel like forcing a patient to go to some incompetent man for lack of money. Therefore I will make you an offer. I cannot reduce my fee, because it is fair. But you can pay me only fifty dollars in cash, and if you find my service satisfactory you may recommend me to your friends, and as soon as I do fifty dollars worth of work for some friend or friends of yours, I will give you a receipt in full for your bill. But, of course, this is a confidential arrangement."

THE PATIENT usually accepts; glad to get one hundred dollars worth for fifty. She also keeps the pact, not being anxious to advertise the fact that she is a half-pay patient. But what is of more importance she does

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not advertise that you are a half-price dentist. All people have acquaintances richer than themselves, and it will be among these richer friends that she will praise the dentist who has done her this kindness. In this manner the dentist establishes the proper fee for his first ten years, even though he may accept less than full fees from many. Better still, he will be building up a clientele that is richer and richer year by year.

THUS WE ARRIVE at another valuable bit of advice. Some day one of the Real Rich will arrive. At that moment opportunity knocks at the young man's door. If the rich person be a woman, as it probably will be, she must be cultivated. A dentist should endeavor to do his best for every patient, and to make all clients his friends. But for this particular woman of influence, he must do more than his best, and of her he must make more than a friend. He must not only give his best service at his topmost fees, but he must so treat the patient that she feels under obligation. Without vaunting his own skill let him make it plain that he is of the newer school, and that he is endeavoring to give her the very best according to the latest discoveries.

A WOMAN FRIEND of this character is the most valuable asset that any practioner may have, and there is probably no successful dentist who will not admit that he has one or more women of this class, from whose friendship he has materially benefited. This being true the young dentist should be ever on the lookout for her.

ODDLY ENOUGH SHE may be brought to the young man's office by the humblest of his patients. Let me close by citing an instance from the experience of a professional friend, and let all young men take to heart the moral of the story.

EARLY IN MY friend's career, when a dollar was worth one hundred cents to him, a stranger came in and asked to have a small buccal cavity in a lower molar filled with amalgam. He agreed to fill the cavity for two dollars. It transpired that the tooth was horribly sensitive and the patient a neurasthenic. The dentist used the utmost patience and his best skill, yet it required more than one hour to fill the tooth. The patient then said: "Doctor, I think I ought to pay you more than two dollars?" But at the outset she had explained that she was a governess out of work, and could not afford a high fee. The dentist was tempted to charge more, but such a course was against his conscience, and he could not fail to abide by his own estimate. So he replied: "It did take more time than I had anticipated, but I cannot charge you any more." Then laughing he added: "Send me a millionaire patient some day, and I will charge the rest to her."

A YEAR WENT by and this woman called one day with two young girls to have their teeth examined, and an opinion expressed. They were

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❖ daughters of a genuine millionaire, in whose household the governess
❖ had found employment. The dentist expressed an opinion, which sub-
❖ sequently he discovered was opposed to that given by the regular family
❖ dentist. That governess persuaded her mistress that the younger man
❖ was "up-to-date," and that the older was "an old fossil." The mother
❖ called, and the young dentist recognized that opportunity was inviting
❖ him. He made a lifelong friend of that Millionairess. She is still his
❖ patient. So are her children. So are their husbands, and their children.
❖ Also other relatives and friends. Altogether my friend roughly esti-
❖ mates that this woman's friendship has been worth over twenty thousand
❖ dollars to him. The governess who brought her has long since passed
❖ beyond his ken. But had he increased that two dollars fee, it is possible
❖ that he never would have seen the Millionairess. By adhering to his
❖ first estimate, he established a reputation for uprightness in the mind
❖ of that governess. Likewise he left her in his debt. And she paid the
❖ debt.



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Memorial Service to George Edwin Hunt.

The dental profession of Indiana will have a memorial service in honor of the memory of Dr. George Edwin Hunt, to be held in the auditorium of the Masonic Temple, North and Illinois streets, Indianapolis, Ind., on the evening of November 21, 1914, at eight o'clock. The principal address will be by Dr. John N. Hurty.

The friends of Dr. Hunt are cordially invited to attend this service.

CARL D. LUCAS, Chairman of Committee.

Dr. Ferdinand J. S. Gorgas.

Dr. Ferdinand J. S. Gorgas, A.B., A.M., D.D.S., M.D., an honorable fellow of the American Academy of Dental Science, died in Baltimore, Md., April 8th, 1914, in the eightieth (80th) year of his life. In his profession he was known and honored as one of the most notable men of his time, both as author and educator. He received the degrees of A.B. and A.M. from Dickerson College, and his dental degree in 1854 from Baltimore Dental College, where he taught as Dean and Professor from 1867 until 1882. He received his medical degree from the University of Maryland in 1863, and was Dean and Professor there from 1882 until 1911, where he held the chairs of Prosthetic Dentistry, Oral Surgery and Dental Medicine. He was editor of the *American Journal of Dental Surgery,* of *Harris' Principals and Practice of Dentistry,* and of *Harris' Dental Dictionary.* He was also author of a work on *"Dental Medicine"* and of *"Questions and Answers for Dental Students."* He was a member of the Maryland State Dental Association, and an honorary fellow of many societies. His burial was at Greenmount Cemetery,

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Baltimore. Professor Gorgas was an enthusiastic teacher, ever eager to raise the ethical and educational standard of his profession. A wife and two sons survive him. These sons are Dr. L. D. Gorgas, of Chicago, Ill., and Dr. H. F. Gorgas, of Baltimore, Md.

Resolved: That in the death of Professor Gorgas the Academy has lost one of its most valued fellows, whose colleagues, recognizing his great educational power, gave to him the many important positions which he held with such marked ability in the institutons he so faithfully served.

Respectfully submitted,

ROBERT R. ANDREWS,
FORREST G. EDDY,
EDWARD C. BRIGGS,
Committee.

Leslie Edwin Palmer, D.M.D.

Died August 13, 1914, in New York City, of appendicitis and adhesions of the intestines, Leslie Edwin Palmer, D.M.D., in his thirty-fourth year.

Dr. Palmer was born in Palmer, Mass., November 23, 1880. Was the son of J. E. Palmer and Clara I. Allen. His early education was received in the schools of Massachusetts, and he graduated in 1907 from Tufts Dental College.

Immediately upon graduation he associated himself with Dr. E. Wunche, of Berlin. He remained there two and one-half years, and returned to New York to become the associate of Dr. Henry W. Gillett. In that association he had rapidly built up a remunerative practice, and had developed a marked ability in practical Roentgenology.

Deceased is survived by his wife, née Jeannette E. Rommel, of Kingston, New York.

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National Society Meetings.

AMERICAN INSTITUTE OF DENTAL TEACHERS, Ann Arbor, Mich, January 28-30, 1915.
Secretary, Dr. J. F. Biddle, 517 Arch St., N. S., Pittsburgh, Pa.

PANAMA-PACIFIC DENTAL CONGRESS, San Francisco, Cal., 1915.
Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

State Society Meetings.

OHIO STATE DENTAL SOCIETY, Columbus, O., December 1-3, 1914.
Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.

National Association of Dental Faculties.

The National Association of Dental Faculties will hold its meeting on the 26th and 27th of January, 1915, at Ann Arbor, Mich. Headquarters, The Allenel Hotel.

This meeting will precede the Teachers Association meeting which will be held from the 28th to the 30th. Besides the regular business there will be several papers of interest to educators read before the association.

The Executive Committee meets at nine o'clock Tuesday, the 26th. Regular session will open at ten.

CHARLES CHANNING ALLEN, Secretary.

B. HOLLY SMITH,
Chairman of Executive Committee,
Kansas City, Mo.

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Forsyth Dental Infirmary for Children. Dedicatory Exercises.

The dedication of the Forsyth Dental Infirmary for Children will take place on November 24th. The management extends a cordial invitation to all members of the dental profession to be present. There will be many new and interesting features, relative to the dental equipment, and the undersigned feels sure that all who accept this invitation will be repaid for making the trip.

The visitors will also thus have an opportunity to see the enormousness of the undertaking and to comprehend something of the inner workings of the institution.

HAROLD DE W. CROSS, D.M.D., Director.

149 Tremont Street, Boston, Mass.

Montana State Board of Dental Examiners.

The Montana State Board of Examiners will hold a session on the second Monday in January, 1915.

DR. G. A. CHEVIGNY, Secretary.

Butte, Montana.

New Jersey Board of Dental Examiners.

The New Jersey State Board of Dental Examiners will hold their regular semi-annual business meeting and examination in the Assembly Chamber of the State House, Trenton, N. J., on December 7, 8 and 9, 1914.

License fee $25. No interchange of license. Practical tests required: Gold filling in a proximal surface of a tooth, also a bridge consisting of three or more teeth, exclusive of abutments, and one Richmond Crown (gold metal), mounted and articulated.

Applications must be filed *complete* with the secretary at least ten days before the date of the examination.

Attention is called to the following requirement: All applicants for a license to practice dentistry in New Jersey "shall present to said Board a certificate from the Superintendent of Public Instruction showing that before entering a dental college, he or she had obtained an academic education consisting of four years' course of study in an approved public or priviate high school or the equivalent thereof."

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In accordance with the above ordinance the secretary will issue application blanks to applicants only upon presentation of the required certificate from the Superintendent of Public Instruction, Trenton, N. J.

For further particulars apply to

ALPHONSO IRWIN, D.D.S., Secretary.

425 Cooper Street, Camden, N. J.

Ohio State Dental Society.

The forty-ninth annual session of the Ohio State Dental Society will be held in Memorial Hall, Columbus, December 1, 2 and 3, 1914.

Papers will be read by Dr. Wm. A. Giffen, of Detroit, on "Technic for Taking Impressions and Making Models for Constructing Artificial Dentures," giving demonstrations with moving pictures; Dr. H. W. McMillan, of Cincinnati, on "Diagnosis and Treatment of Trifacial Neuralgia"; Dr. W. W. Curtiss, of Greenfield, Ohio, on "Conservation vs. Radicalism"; Dr. J. R. Callahan, of Cincinnati, "A Lantern Lecture on the "Use of Rosin in Operative Dentistry."

A selected list of progressive clinics will be given on Wednesday forenoon and general clinics on Thursday forenoon.

One evening will be given to a Health Conservation Conference to be participated in by all professions and interests devoted to the furtherance of human health and welfare.

A cordial invitation is extended to all society members from other States.

F. R. CHAPMAN, Secretary.

305 Schultz Building, Columbus, Ohio.

Iowa State Dental Society.

The Northwestern District of the Iowa State Dental Society will hold a clinic and manufacturers' exhibit at the Martin Hotel, Sioux City, Ia., November 30th, December 1st.

Nearly all of the leading manufacturers have signified their intention of having a representative present with a full line of exhibits.

The following men will appear on the program: Dr. T. B. Hartzell, Minneapolis, pyorrhea clinic and paper on "Secondary Infection"; Dr. W. H. MacNeil, Minneapolis, paper and clinic on "Conductive Anesthesia"; Dr. T. J. Kirby, Holton, Kansas, paper on "Dental Economics."

A banquet and special entertainment will be a special "feature."

C. E. WESTWOOD, Secretary.

500 F. L. & T. Building, Sioux City, Ia.

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SAN FRANCISCO.



An Expanding Root Canal Filling.

By George Bailey Harris, D.D.S., Sc.M.

Experiments made by the author in the Research Laboratories of Parke, Davis & Co.

A root canal filling, to prove beneficial and successful for what it is intended must fulfill certain conditions, some of which are as follows:

1. It should be non-contracting, or, if it must contract, the contraction should occur in the centre of the filling, and not from the side of the filling toward the centre. In other words, the canal filling should adhere to the walls to such an extent that when contraction takes place it will be from the centre of the filling toward the walls of the canal.

2. The filling should be mildly antiseptic during its plastic state and have solidification take place slowly.

3. Upon drying, it must not be reduced to a powder, leaving the canal less than half filled.

4. It should be removable.

5. It should be non-irritating.

6. It should prevent the passage of the Roentgen ray.

Were these points applied to the root-canal fillings now being used, we would find one or more of these conditions not fulfilled.

Chloro-percha.

Chloro-percha, which is used more than any other substance for this purpose, is not immune. It does not prevent the penetration of the rays and it contracts upon drying. It will not contract from the

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canal wall if the wall is perfectly dry, but it will not adhere to it if there is the least bit of moisture in the canal. This results in an incomplete or partially filled canal.

This is overcome to a certain extent by the use of the gutta-percha point, but the point must go to the end of the root to do this. Radiographers show time and again that the point does not reach anywhere near the apex of the root in a great many cases where such a procedure would seem to be a simple matter. Again, chloro-percha does not readily follow the canal, having a tendency to form a ball when placed in the canal, due to the rapid evaporation of the chloroform. This is overcome to a certain extent by the use of eucalyptol, or like substance; but experiments show that this is far too irritating to be used in root-canal fillings. The X-rays pass through chloro-percha, making diagnosis by this means extremely difficult.

Paraffin.

The case of paraffin is somewhat different. Here we encounter the contraction from the wall toward to centre and more or less difficulty in getting it to the apex of the root due to its rapid solidification. It does not hold back the X-rays nor can it be made antiseptic, so that it will remain so after solidification.

The Author's Experiments.

Bearing these facts in mind, we set out to produce a substance that would remove as many of these objections as possible, and we believe we have at least partially succeeded. In the first place we have a substance that will expand upon solidifying, instead of contracting. To the liquid is added a "binder" that will not permit its return to a powder upon drying out.

This preparation consists of a powder and a liquid. When these two are mixed together a chemical reaction takes place which results in the expansion of the paste, for it is a paste.

Now, when the paste is stirred rapidly, a contraction results. When the paste in this state is sealed in a pulp chamber it again expands to the chemical reaction which again takes place and which is exaggerated by the rise in temperature. The rise in temperature causes it to take on a semi-solid form, which can be hardened at once by the addition of one drop of another liquid to the canal contents. If this is not added the filling will harden in about two weeks.

At first it was considered necessary to seal up the apex of the root to prevent the expanding paste from passing through the apex, and a great deal of time was devoted to solving this, the final decision being that the best substance for the purpose is a triple salt of tin, made by passing chlorine gas through tin chloride.

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After studying the expansion, we found that it could be easily and absolutely controlled; that the expansive power could be eliminated entirely on the one hand or it could be made to expand to such an extent that it would force out a gutta-percha plug when the "normal" or a little above "normal" expansion was placed against resistance equal to that which it would encounter in a root having a foramen of the diameter of ½ mm. Under these conditions it was found that the expansion was not so great as the tissue pressure or resistance outside of the apex of the root, and that the paste would not pass through unless all expansion possible to put into the paste were used, and it is possible to get considerable more pressure outside the mouth than in, due to a lower temperature at which the experiments may be carried on. For this reason we find that lining the canal and sealing up of the apical foramen are unnecessary, except in deciduous teeth, where we believe that an expanding canal filling is both contra-indicated and unnecessary.

There are several ways by which the expansion of this material may be controlled. The most important one is the temperature at which it is mixed and the temperature at which it is introduced into the root canal. If it be mixed at the temperature of the body, there will be neither expansion nor contraction; above that temperature, contraction will take place, and below, expansion. The higher above the normal temperature of the body it is mixed the greater will be the contraction, and the lower the temperature, the greater will be the expansion. So sensitive is it to heat and cold that a fraction of a degree will show a decided difference in its behavior in regard to the expansion or contraction in or out of the canal. Another consideration is the time elapsing between its introduction into the canal and the sealing of the canal. This would effect the expansion only. As soon as it is introduced into the canal, either expansion or contraction begins, unless it is introduced at exactly the temperature of the canal. Expansion will take place along the lines of least resistance, and if the canal is not sealed it will expand out. The more quickly it is sealed in the greater will be the expansion, and where no expansion is desired it is only necessary to leave the canal open for from five to ten minutes, to allow all expansion to take place, then sealing it up. There will then be no pressure in the canal and the filling will not be dense. Should it then be found desirous to expand it, or to condense it a little, all that would be required would be the addition of one or two drops of liquid introduced into the canal at a low temperature and quickly sealed with cement. Expansion and condensation will then take place in a very few minutes. The density of the filling will be governed by the quantity of the powder added to the liquid as well as the temperature. The more powder used, the slower will be the expansion, the denser the filling and

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the less the expansion. However, by the addition of all the powder possible to add to the liquid, the expansion cannot be prevented entirely.

Tube Experiments with Expanding Root Filling.

Where contraction takes place it contracts in the centre. This is shown in Fig. 1, tube 2. This tube was filled up to F and then gently warmed until it expanded to R. It was then allowed to cool. Contraction occurred, not at the side of the tube, but in the centre of the filling downward and toward the sides of the tube to N, the remainder being solid. The distance from F to N represents the extent of normal expansion contained in the paste at the temperature it was mixed and at

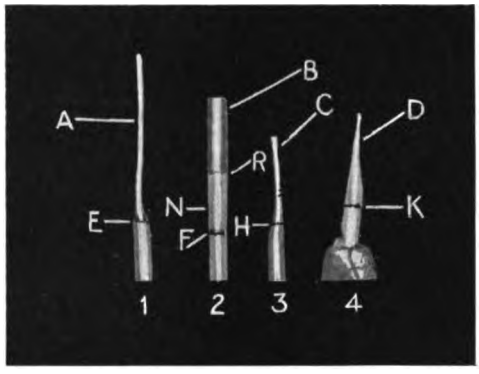


Fig. 1.

room temperature. An alcohol flame was then applied below F and expansion again took place, expanding to B. Were this temperature maintained until solidification occurred no contraction would result, but as the flame was withdrawn as soon as B was reached, contraction took place, finally returning to the same level where it was before the alcohol flame was applied. As this tube is of the same diameter throughout its full length, the paste was expanded more than its own volume and maintained it throughout solidification. To show how sensitive it is to thermal changes, we will consider tubes 3 and 4 in the same illustration. In these two cases the paste was prepared at room temperature and put into the two tubes at the same temperature. No heat was applied from outside sources, *i. e.*, all the heat involved in producing the expansion was the result of the chemical reaction which took place as a result of the powder and liquid being mixed together. As a matter of fact, the rise in temperature is so slight that it is detected with difficulty; yet this small change is sufficient to cause the mixture to expand from H to C in No. 3 and from K to D in No. 4.

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Were the paste allowed to dry and then be pulverized and have the liquid again added, while it would expand under certain conditions, its extreme sensitiveness would be lost, but there would still remain sufficient expansive powder to fill a reasonable space. Its response, however, would be slower.

In the experiments shown so far, all the tubes have been open at one end, allowing the air between the paste and the end of the tube to escape as expansion took place. This condition does not exist in a root canal. What then becomes of this air in the canal? Is it forced beyond the apex of the root into the surrounding tissues, or will it prevent expansion? It is not forced beyond the apex, because the same amount of pressure preventing the paste to expand beyond the apex also prevents the air from passing beyond. Again, it does not prevent expansion.

Tube No. 1 shows the expansion taking place in a sealed tube quite as readily as it does in the open tubes. This tube was filled and the filling expanded under the same conditions as were Nos. 3 and 4, the air offering no resistance whatever. The air is taken up by the paste as it expands, filling the microscopal spaces produced when the molecules swell during the expansion, and there it remains. Whether any of the air is chemically taken up by the paste or not has not yet been determined, but it likely is not.

Possibility of Removal of Root Filling.

The next consideration is its removal from the canal, should this become necessary. Let us suppose that complete solidification has taken place and that the filling is perfectly hard. Its removal is an easy matter. Simply open up into the pulp chamber and then chill the tooth with ice or a cold blast of air and fill the canal with the expanding liquid, previously chilled. This will be rapidly taken up by the filling when another drop is added, keeping both the liquid and tooth as cold as possible. Remove the ice or cold blast and either apply a warm blast or allow it to be warmed from the tissues. In a few minutes it will again expand, following the line of least resistance, which in this case will be toward the crown of the tooth. In other words it will expand outwardly. Additional liquid can then be carried on a broach and the entire filling removed without any danger of forcing it through the foramen and without the slightest discomfort to the patient. The operation is also very quickly done.

Resistance to X-ray.

An important feature which this material possesses is its ability to stop the Roentgen ray. This was overlooked in the original powder and was suggested to me by Dr. Giffin, of Detroit, who pointed out its extreme importance, and after considerable experimenting we were

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able to add this factor to the material without interfering with any of the other points. Supposing that we fill a root canal, or, better, fill two root canals in a molar tooth, but are unable to get into the third for some reason. The chances are that this third root will be completely filled by the expanding, but we would not be sure. An X-ray would tell this at once, and in case it was not completely filled all that would be required would be the addition of a little liquid, resulting in a continued expansion. This operation would be continued until the radiograph showed all the canals completely filled. This can be done in third molars by simply filling the pulp chamber half full of the paste, filling the balance with cement and allowing the expansion to fill the canals.

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The Practical Application of our Knowledge of the Resorption of the Roots of Permanent Teeth.

By Rodrigues Ottolengui, M.D.S., D.D.S., LL.D., New York.

Read before the American Society of Orthodontists at Toronto, July, 1914.

Last year it was my privilege to call the attention of our members to the fact that roots of the permanent teeth, notably the incisors, may be resorbed, the phenomenon very much resembling the normal physiological shortening of the temporary teeth, especially as in both instances the pulps remain alive.

In the course of my communication of last year I described and illustrated various types of root destruction, dividing these into physiological and pathological. In regard to this I said:

"By physiological resorption I mean that resorption of a root which occurs as a part of the normal routine, as when the roots of deciduous teeth resorb to accommodate the erupting successor. There is one marked clinical fact to be noted in regard to physiological resorption, and that is that the pulp of the deciduous tooth, though shortened with the root, remains alive.

"By pathological resorption I mean a resorption inaugurated by some outside interference with the normal routine. There are several distinct kinds of pathological resorption, which are accompanied by clinical aspects, which are fairly constant when studied with the X-ray."*

As examples of pathological resorption I exhibited radiographs of roots shortened as a result of alveolar abscess, and in another instance due to the presence of an extensive tumor. I mentioned that I had known of cases where erupting third molars had caused resorption of the distal surfaces of second molars, but at that time I had no case which I could

*Items of Interest, May, 1914, page 335.

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show. Through the courtesy of Dr. Theodore Blum, I am now able to give you the pictures and clinical history of such a case.

Pathological Resorption.

The patient had reported excessive pain in the third molar region and was referred by his dentist to Dr. Blum for a radiographic diagnosis. Fig. 1 shows the radiograph in which the impacted third molar appears to be impinging upon the distal side of the second molar.



Fig. 1. (Theo. Blum)



Fig. 2.



Fig. 3.

It is, of course, to be recognized that the actual positions of teeth as seemingly disclosed by radiography, may be more or less deceptive. It is very doubtful that there was any actual contact between these teeth I allude to this particular point, because last year I said that this type of root destruction may be called "traumatic." By traumatic we usually conceive the idea of an injury resulting from a blow, and, of course, a third molar cannot strike a second molar, as a hammer strikes a nail. But I take it that an injury following an actual blow is not a result of the impact of the striking object, but is rather due to morbid processes

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set up by the force exerted by the blow. Thus if a man have his fingers crushed between two rollers in a rolling mill, the injury can as properly be called traumatic, as where they are crushed by a falling heavy weight. Similarly, I think, we may consider the destruction of one tooth root by the forces of eruption of an approaching tooth to be traumatic in character, quite as appropriately as where the root destruction follows an actual blow.

I think, therefore, that in the case of the molars in question, we need not look for actual contact, to account for the resorption of the stationary tooth, but we may believe that the destruction is due to morbid processes set up in the path of the moving tooth. It is singular, however, and must have some clinical significance, that the destroyed area seems to assume the exact form of the approaching tooth surface.

Dr. Blum's diagnosis was that the approaching third molar had caused resorption of the second, to an extent involving the pulp, thus accounting for the neuralgic pain. Both teeth were extracted, and in Fig. 2 I show them to you placed in contact, to indicate how closely the destroyed area in the second molar matches the shape of the cusps of the third. In Fig. 3 we see the distal surface of the second molar, and the extent of the resorption.

Resorption of Implanted Teeth.

The subject of tooth implantation is one that should very greatly interest the orthodontist. If this operation could be safely conducted it would solve many problems for us. Unfortunately, the length of time which may be reasonably counted upon for the retention of an implanted tooth is so problematical, that the operation is a questionable procedure.

It has heretofore been my belief that the eventual loss of the implanted teeth is due to some traumatic injury. There is little doubt that any extra impact, whether from an actual blow, or by biting through some hard substance and thus suddenly bringing the incisive edge of the implanted member against that of its antagonist, might excite an active osteoclastic action which would rapidly destroy the root. With the evidence that I am about to submit I must add to this theory the view, that implanted teeth are constantly receiving traumatic blows, slight in degree of stress perhaps, but destructive in their effects, because of the fact that, the implanted tooth having no periosteal cushion to protect it, is unprepared to resist the forces of mastication. Under such circumstances the implanted root is constantly and progressively resorbed till lost.

Fig. 4 is a radiograph, taken June 19, 1913, and was shown last year. This tooth had been accidentally removed from its socket, and

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because of the youth of the patient, I recommended replantation, and with the consent of the dentist and of the child's parents, I performed the operation about one year prior to the making of this radiograph. I would once more call attention to the difference in appearance of this root and



Fig. 4. (Ottolengui)



Fig. 5. (Ottolengui)



Fig. 6. (Ottolengui)



Fig. 7. (Ottolengui)

the adjacent roots. I believe that sound roots cast more distant shadows because of the presence of the cementum, and that when this is wholly or partly lost by resorption, as in the case of implanted teeth, we have a lessened resistance to the ray, and a consequent reticulated appearance.

Fig. 5 is a radiograph of the same tooth taken May 2, 1914, and I think proves conclusively that the resorption of this root has been progressive, and that consequently the future of the operation is most discouraging.

Fig. 6 was also shown last year. It was taken on March 4, 1913, about two years after the tooth had been replanted by another practitioner. The attachment of the root through osteoclastic resorption fol-

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lowed by the building in of new bone is well shown. Quite by accident the apex of the adjacent lateral incisor appears in the field and seems to be intact and fully formed.

Fig. 7, a radiograph of the same case taken March 12, 1914, shows that here again the resorption of the central incisor root has been progressive, and that prognosis predicates a final loss. But of still greater



Fig. 8. (Schamberg)



Fig. 9. (Ottolengui)



Fig. 10. (Schamberg)



Fig. 11. (Ottolengui)

interest is the apparent shortening of the lateral incisor by resorption. The loss is slight, and may be doubted by some. But I have three radiographs taken at varying times from March 12 to May 7, and in all the apex of the lateral seems to have suffered. However, it will be interesting if possible to obtain radiographs again a year from now. Indeed, it would be most instructive if we might have annual radiographic records of a large number of implanted or replanted teeth, and those who still have confidence in the operation would be serving science and future patients by having such records made.

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In the discussion last year Dr. Dewey, speaking of the resorption of living permanent teeth, said, "It would be interesting to find out in these cases whether the resorption stops or progresses until the whole tooth is lost." In the case from my own practice reported last year, I recorded the fact that on the left side the lateral incisor was finally lost, or rather extracted, because of the eruption of the cuspid. The root of this lateral had entirely disappeared. The condition in the region of the central incisors, and of the right lateral and cuspid, however, may have some clinical significance.

Fig. 8 is a radiograph showing right lateral incisor, and also the right central and cuspid, taken by Dr. Schamberg October, 1910, which may be compared with Fig. 9, a radiograph taken by the writer on April 25, 1914. Fig. 10 shows a radiograph of the centrals taken by Dr. Schamberg in October, 1910, and Fig. 11 shows a radiograph taken by the writer in April, 1914. Here we find that the cuspid has advanced very little, and while the lateral root is a little shorter, the centrals seems to be about the same. It is noteworthy that these teeth are somewhat protected from the stresses of mastication, owing to the fact that they are in infra-occlusion to such an extent that they cannot be made to touch the lower incisors.

Before proceeding to the consideration of my actual text, I beg the privilege of recording a few more cases of root resorption which have been brought to my notice during the current year.

Dr. Ketcham's Case.

The following history, accompanied by radiographs was sent to me by Dr. A. H. Ketcham, for an opinion.

"The patient is a lady, thirty years of age; temporary cuspid root had been crowned, over which is a chronic alveolar abscess. She was sent to me for diagnosis by the means of the X-ray. At the first sitting I made two exposures (Figs. 12 and 13), which show the impacted cuspid and the apex of the central incisor root apparently lying posterior to the crown of the cuspid, and, apparently, absorption of the lateral incisor root end. I hesitated about making a positive diagnosis without further radiographs, so made the two exposures seen in Figs. 14 and 15. These show that there is a layer of bone between the apparently absorbed lateral incisor root and the cuspid, forming the cuspid crypt. Then I remembered having made radiographs of a case—a lady of mature years—in which a bicuspid had apparently run against the hard floor of the antrum and stopped forming instead of following its usual course and perforating the floor of the antrum. This is illustrated by Figs. 16 and 17, made from two films which were placed face to face in a package for exposure.

"So the question has arisen in my mind, is it not possible in rare instances that a tooth root when forming, upon pressing against a hard substance like the dense bone forming the crypt of a tooth, or the floor

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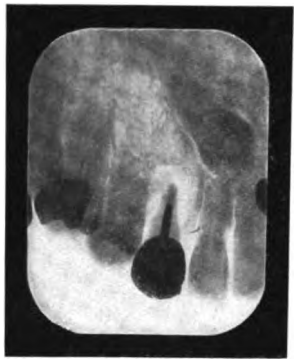


Fig. 12. (Ketcham)

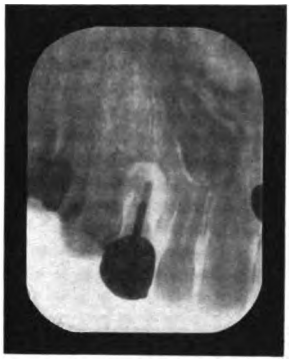


Fig. 13. (Ketcham)



Fig. 14. (Ketcham)



Fig. 15. (Ketcham)



Fig. 16. (Ketcham)

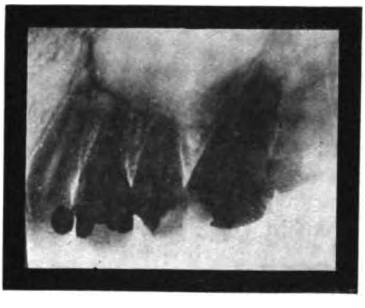


Fig. 17. (Ketcham)

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of the antrum, may be arrested in growth and instead of showing absorption of the roots, the radiographs show arrested development?"

This case differs from any so far reported because we have the erupting cuspid, as in other case, but likewise we have an extensive alveolar abscess on an adjacent root, so that the lateral seems, as it were, to have been "between the devil and the deep sea." Believing that something might be determined by the condition of the pulp, I wrote and asked whether or not the pulp in the lateral had died. Dr. Ketcham replied as follows: "Dr. Howell tested the lateral incisor having the resorbed root end, and without knowing his conclusions I tested it. Our diagnosis is vital pulp." From this fact it is my view that the destruction of this root has not been caused by the nearby alveolar abscess. The clinical picture is different also, because where resorption results from an infectious condition, we find the alveolus itself likewise resorbed, whereas in this case it is intact close to the resorbed end of the lateral root, thus resembling physiological resorption of temporary teeth.

Dr. Howell's Case.

At the request of Dr. Ketcham, Dr. J. L. Howell, of Denver, has kindly sent me the following history. Unfortunately the radiographs could not be found.

"Miss Margaret McDonald, aged nineteen, when twelve years old had her left temporary upper cuspid knocked out by a blow in the mouth.

"The left lateral evidently moved back in the place of the cuspid.

"When the patient applied for treatment the left central was very loose: owing to the fact that she had had a blow in the mouth several years before, I assumed that the central had been fractured at the same time.

"On opening into the pulp chamber, I found the pulp alive, and after removing the pulp I discovered no root to the central, no more than in a deciduous tooth that is almost ready to come out.

"I also discovered a hard substance which proved to be the cusp of the cuspid."

Dr. Hoffman's Case.

At the request of Dr. Ketcham, Dr. Henry F. Hoffman, of Denver, sent me the following history:

"Dr. Ketcham tells me that you desire data concerning the absorption of the roots of permanent teeth, and requests me to report to you a case which occurred in my practice.

"February, 1898, Miss H., age 13 or 14, presented with the upper left permanent cuspid almost fully erupted labial to and in contact with the lateral incisor, the buccal teeth having moved mesially sufficiently to nearly close the space for the cuspid.

"Examination disclosed what seemed to be a cervical cavity on the labial side of the lateral incisor just beneath the margin of the gum, on the surface in contact with the cuspid. With the intention of filling

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this cavity before any other treatment was instituted the teeth were slightly separated and the cavity packed to force the gum tissue out. After doing this, no cervical wall could be found to the cavity and the case was considered one of absorption rather than caries. The tooth was extracted and the entire labial side of the lateral incisor root from the junction of the cementum with the enamel to the apex, was found to be absorbed, and the pulp exposed for nearly the entire length of the root.

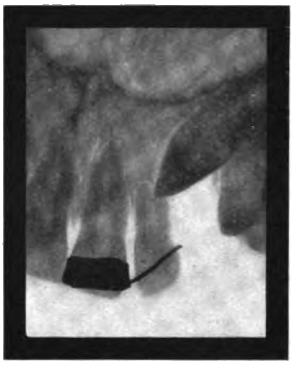


Fig. 18. (Ottolengui)



Fig. 20. (Satterlee)

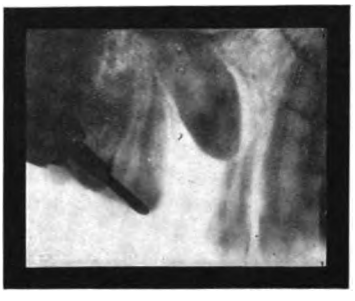


Fig. 19. (Satterlee)*

The pulp was vital at the time of extraction, and the patient had experienced no pain from it. The cuspid root showed no signs of absorption and subsequently assumed, without aid, the position of the lateral incisor.

"Unfortunately the extracted tooth and models were lost, but the case was seen by Dr. W. T. Chambers and Dr. J. S. Jackson, both of this city."

This history is most interesting, because of the fact that the cuspid erupted completely, without pain and without destroying the vitality of the pulp of the lateral, in which respect the clinical symptoms are quite different from what seems to occur in the third molar region, where we always hear of pain, either due to impingement upon the vital pulp of the second molar, or else from the death of that pulp.

*This seems to have been printed with film reversed.—Ed.

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the teeth at their apices. As the patient was to be absent four months, this bending of the arch was not made very extreme, for which I was subsequently grateful.

In October last, when I saw the patient again, I found that the central incisors had assumed a fairly erect position, but the lateral crowns were still converging distally.

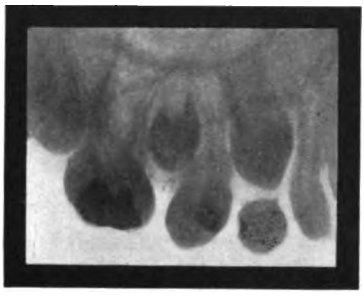


Fig. 27. (Ottolengui)

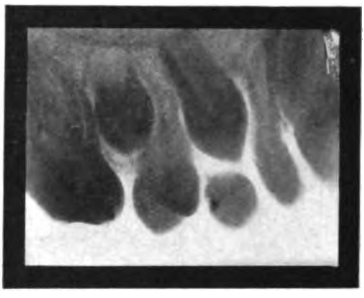


Fig. 28. (Ottolengui)

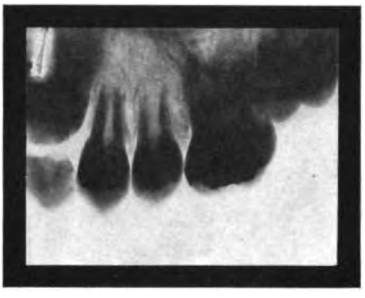


Fig. 29. (Ottolengui)

Having in the meantime presented my paper on this subject, it occurred to me that it might be well to radiograph the case. Figs. 21 and 22 show the condition and position of the laterals and cuspids right and left. These were made October 4, 1913. From a study of these radiographs, and especially that of the right side, I decided that it would be hazardous to attempt any distal movement of the lateral roots, and by explaining matters fully to the mother my course of "watch and wait" so far as this particular region was concerned, was heartily approved.

I used the new Angle appliance, with bands on the central incisors, with which I further improved the position of these teeth, by moving the apices labially, thus slightly enlarging the apical arch. Sometime in February, 1914, I deemed it safe to engage the left lateral and I transferred the band from the left central to the left lateral, slowly and carefully drawing the lateral mesially, without, however, attempting to move its root distally.

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On May 9, 1914, as both cuspids were evidently approaching eruption, I made the radiographs seen in Figs. 23 and 24, made in this manner to match those made in October, 1913. I also made the radiographs shown in Figs. 25 and 26, and from a study of these I deemed it safe to remove the band from the right central, and to band in its stead, the right lateral, and then proceed to draw the lateral crown toward the central, closing the space between it and the central. At the present time all four teeth are in satisfactory position, and while no risk might have been run in moving the laterals earlier, certainly no harm, and some possible advantage has been gained by waiting.

Case II. In another case a girl aged nine was brought to me for examination. An upper second temporary molar had been prematurely lost and the first permanent molar had drifted mesially. I radiographed the case to determine whether or not the second bicuspid were present.

In Fig. 27 we see that the second bicuspid is in the bone, but has very little root. We note also that the first bicuspid apparently has little root, and we observe that both the cuspid and the second bicuspid appear to be crowding down upon it. In an attempt to get a better view of the root of the first bicuspid, a radiograph at a different angle was made and is shown in Fig. 28. Several other exposures have been made at different times, but it seems impossible to obtain any more definite information as to the exact length or stage of development of this tooth. Fig. 29 shows the bicuspids of the opposite side for comparison, and we observe that though the bicuspid crowns are fully erupted, the root development is not far advanced. A study of this case by the models alone, and treatment based thereon, would indicate the need of immediate interference to move the drifted first molar distally in order to give room for the impacted second bicuspid. But a study of Fig. 27 shows us that the unerupted second molar lies in just such a position relatively, as was seen in Fig. 1, where we saw a third molar erupting against the second. Any forcing of this first molar backward against the second would, in my view, possibly inaugurate resorption of the distal surface of the first molar. Believing, therefore, that it would be safer to undertake this a few months later, by which time the second molar crown may have advanced sufficiently to bring its enamel surface against the enamel of the first molar, and also considering that further development of the first bicuspid root might render operations in that region safer, I have advised delaying work until next autumn. Perhaps I am unnecessarily cautious, but I believe in the soundness of my position in these two cases. And while I still am an advocate of early treatment, I am of the opinion that such treatment will be more wisely and successfully administered if checked up and guided by radiography.

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Desensitizing Paste.

A New, Safe and Reliable Remedy for Hypersensitive Dentin.

By J. P. Buckley, Ph.G., D.D.S., Chicago.

Read before the Second District Dental Society of the State of New York, October, 1914.

In the early history of civilization, we find that the possession of the cardinal virtue of fortitude was considered a mark of courage, strength and character, because it enabled the individual to willingly undergo the necessary pain, peril or danger incident to life. But the discovery of anesthesia by humanity's greatest benefactor, Horace Wells, the dentist, together with the humanitarian tendencies of the years, have so changed human nature that we find few people to-day who possess the spirit of fortitude as manifested in ancient times to any marked degree. Among other things in life, this condition of affairs demands more painless methods of practicing dentistry. The one dental operation which has caused more pain in the past than all others combined is that of the preparation of cavities in vital teeth.

Ever since the art of filling teeth was first begun both the dentist and patient have cherished the ardent hope that some day it would be possible to perform this operation without pain. Especially is this true in these modern times, when to carry out the basic principles of cavity preparation, as understood to-day, it is necessary for the cavity to have a flat seat with practically parallel walls; that it should possess resistance, retention and convenience form, and that the outline be carried to areas of immunity—all of which requires drilling into sound and usually extremely sensitive dentin.

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Sensitiveness of Dentin.

Authorities differ in regard to the sensitivity of dentin. Some claim that normal dentin is without sensation; while others assert, with equal authority, that all vital dentin is sensitive. Black differentiates between hypersensitiveness and thermal sensitiveness of dentin, claiming that the sharp pain caused by sudden changes of temperature is normal, though no other tissue or organ of the body shows a like resistance to thermal changes. Under certain conditions hypersensitiveness to thermal changes may develop, when the condition becomes pathologic. In so far as the therapeutics of hypersensitive dentin is concerned it matters little whether normal dentin is sensitive or not, for clinical experience teaches us that thermal sensitiveness as well as hypersensitiveness of dentin often develops during the progress of decay; therefore, in the preparation of a cavity for filling we find few teeth in which the dentin is not sensitive. The degree of sensitivity differs markedly in individuals and in the same individual at different times.

Previous Attempts at Controlling Pain.

For years men of all classes, from the conscientious practitioner to the charlatan and quack, have endeavored to invent means or discover remedies for the elimination of pain caused by operations upon vital teeth. In 1836 Dr. Spooner, of Montreal, thought he had made the discovery when he introduced arsenic trioxid as a remedy for desensitizing dentin. In more recent years cataphoresis, high pressure injection of cocain, interosseous and conductive anesthesia have had their advocates. All kinds of local remedies have been suggested. General analgesia by chloroform and nitrous oxid has long been used by a limited number. Later, analgesia by somnoform or nitrous oxid and oxygen has been revived. Many are using these various agents to-day with more or less success—not because they are in full sympathy with the methods or means, but because they seem to be forced to use something; and their patients are willing to submit to almost any process if pain can be avoided.

Any method or remedy for the elimination of pain in filling teeth, which necessitates placing the tooth or patient in such condition that the dentin can be painlessly drilled to any depth, is a dangerous one to place in the hands of the profession in general. Pain is Nature's indicator, and pain should be our guide. I have been of the opinion for years that the ideal method of desensitizing dentin would be the application of a remedy within the cavity which would affect the dentin only to a given depth, and thereby not reached nor affect the pulp. I was somewhere near the truth when in 1909 I stated. in my book on "*Modern Dental*

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Materia Medica, Pharmacology and Therapeutics," after discussing the use of escharotics for obtunding sensitive dentin and taking up "*Local Anodynes or Local Anesthetics,*" that "in the judicious use of agents belonging to this class, the author firmly believes will ultimately be found the surest and safest road to success" (page 265). But where could we find such a remedy?

Some of my intimate friends and associates in the profession told me that it was my duty to discover this remedy or work out some practical formula. They endeavored to convince me that my previous training along the line of chemistry and pharmacy made it incumbent upon me to perform this task. I accepted the challenge and went to work, quietly but, nevertheless, persistently. The results I am here to-night to relate; for this hope of the dentist and patient for painless cavity preparation has now been realized.

I have the pleasure of bringing to you a new formula, which, if properly compounded from pure drugs and used with intelligence and care, will prove a boon to dentistry and a blessing to humanity.

It is a formula which has been given every test and which answers every purpose for which a remedy of this kind should be employed. It is an absolute *specific* for hypersensitive dentin, for it will never fail to desensitize the area of dentin immediately beneath the point of application, and it will do so without causing the tooth to ache, to any appreciable extent at least, and without injuring the pulp of the tooth.

Though my work has been a labor of love, it has not been easy. My problem has not been simply to desensitize dentin. This may be accomplished in many ways; but to get a remedy that is practically foolproof—one that will densensitize the dentin without affecting the pulp—this has been the problem.

Shortly after S. S. McClure started his cheap popular magazine, in the panic of '93, he was greatly discouraged because of financial difficulties, and he made a visit to his friend, Professor Henry Drummond, at Northfield. They took long walks together; and one day, when they were off in the country, sitting on the grass, McClure told Drummond that he did not see how he could possibly pull through the task he had undertaken—that he did not feel strong enough to do it, and that he always seemed to be undertaking more than he could do. In his autobiography McClure says: "I have never forgotten Drummond's reply He said: 'Unless a man undertakes to do more than he possibly can do, he will never do all that he is capable of doing.'" I can say that many times in the last few years I have felt as though I were seeking for the impossible; but my friends encouraged me, and I am happy to say to you to-night that at last my efforts have been rewarded.

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Effects of Formaldehyd on Dentin.

I have known for some time that formaldehyde would desensitize dentin, but how to control the action of the gas, and how to combine it with other compatible drugs that would modify its irritating effect, and make a stable product, has been the difficulty. It was absolutely essential that the formula should contain no arsenic, and if possible I preferred to have it contain no cocain. Yet it was necessary to use some local anesthetic agent to prevent the formaldehyde from causing the tooth to ache. Novocain is too slow in its action. The agent used here must act rapidly as soon as it is applied. Orthoform will do this, and I used it at first, only to find that it was incompatible with my essential ingredients, for a reaction gradually takes place. After months of experimenting, the pharmaceutical firm of Eli Lilly & Company came to my rescue. Their scientific department has developed a new synthetic local anesthetic, called neothesin, which answers my purpose.

Analysis of Formula of Desensitizing Paste.

The formula for Desensitizing Paste, the name which I have given the remedy, contains neothesin, thymol and trioxymethylen, in the proportion of eleven, twelve and seventy-seven parts, respectively; all combined with a petroleum base, and incorporated in a fibrous vehicle and colored with an insoluble pigment. One grain of the preparation is sufficient for about fifteen applications. On this basis the amount necessary for one application contains neothesin 1/300 grain, thymol 1/270 grain, and trioxymethylen 1/43 grain.

Neothesin.

Neothesin $(CH_3)_2N\ (C_7H_{11})\ (C_2H_5)\ OCO\ (C_6H_5)$, HCl is a new synthetic product, as stated above, possessing marked local anesthetic properties. It occurs as a white, freely soluble powder, and is rapid in its action.

Thymol.

Thymol $C_6H_3\ (CH_3)\ (OH)\ (C_3H_7)$ is a crystalline compound obtained from the volatile oil of *thymus vulgaris*. It occurs in large colorless crystals, has a characteristic odor, and is practically insoluble. It is recognized as a penetrating drug and has marked disinfectant properties.

Trioxymethylen.

Trioxymethylen $(CH_2O)_3$ is a compound formed by the polymerization of formaldehyd. It is a white powder, practically insoluble, stable at ordinary temperature, but at body temperature formaldehyd is slowly liberated.

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Pharmacology of Desensitizing Paste.

It is highly essential that we understand how the desensitization is brought about when Desensitizing Paste is applied to the dentin. The neothesin applied directly to the exposed sensitive dentinal fibrillae acts quickly thereon and temporarily paralyzes the ends thus exposed. The thymol volatilizes and per-

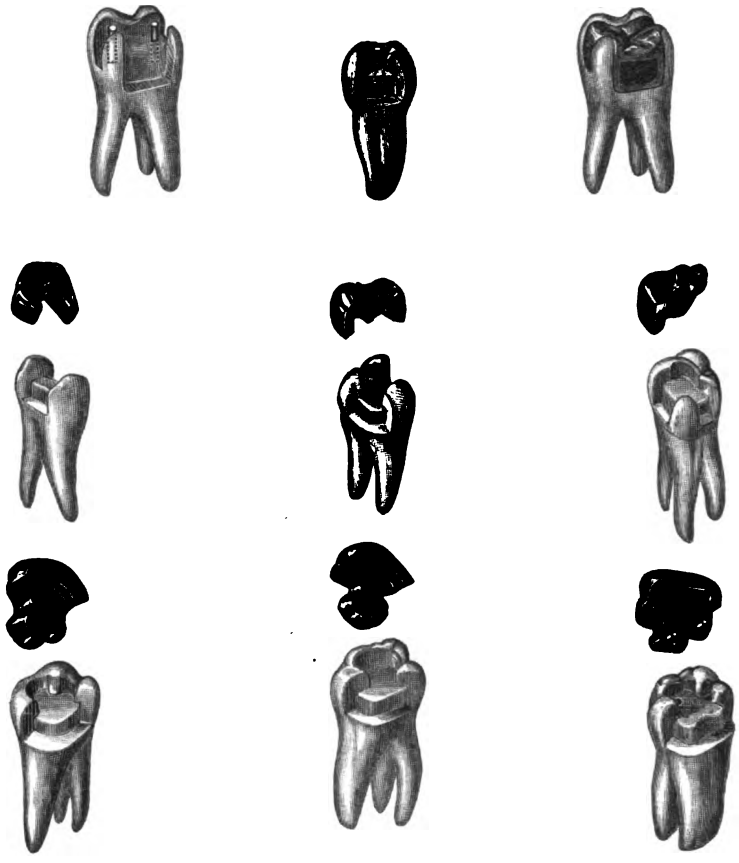


Fig. 1.

meates the softened dentin. The heat of the body gradually liberates formaldehyde from the trioxymethylen, which gas diffuses through the decayed dentin, combining chemically with the amine group of the protein constituent of the dentinal fibrillae. The formaldehyde also acts upon certain intermediate and end-products that may be present in the carious tooth-structure as a result of albuminous decomposition, and

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this agent, together with the thymol, brings about *complete sterilization*. Thus the dentin affected by the remedy is not only *desensitized,* but *sterilized* as well, which is an all-important factor. The vitality of the fibrillae is destroyed in the area affected, but the remedy will not affect sound dentin to any dangerous depth. In the preparation of the cavity, in the average case, the dentin affected by the remedy is practically all removed. If it is not, I know from my experience with the paste that the vitality of the fibers is subsequently restored, for after a few weeks



Fig. 2.

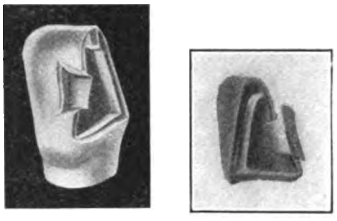


Fig. 3.

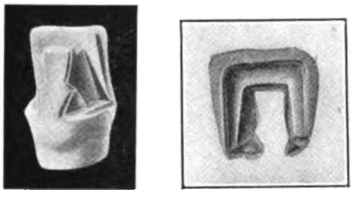


Fig. 4.



Fig. 5.

sensation returns. While this regeneration of the fibrillae is being brought about, the tooth may develop slight thermal sensitiveness which lasts for about a week. This occurs only in a small percentage of cases. I simply mention it here that the operator may know the cause and that it will be of short duration should such sensitiveness develop.

Indications for Use of Paste.

Desensitizing Paste may be used with perfect safety in all cases of hypersensitive dentin where the pulp of the tooth is not diseased to the extent of necessitating the removal of the organ because of its pathology. It is not necessary to employ the remedy in every case of cavity preparation. Where the pain is not great, and where the patient is willing to endure the small amount, no therapeutic remedy is needed; but every dentist has those cases where it is impossible to do satisfactory work because of the hypersensitiveness of the dentin. In all such cases the use of Desensitizing Paste will prove a blessing to humanity and a

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God-send to those earnest practitioners who have grown gray and nervous standing at their chair trying to properly prepare cavities in the teeth of hypersensitive patients.

In his work on "*Operative Dentistry*," Dr. G. V. Black says: "The treatment of sensitive dentin for the purpose of relieving or limiting the pain in the excavation of cavities has been prominently before the dental

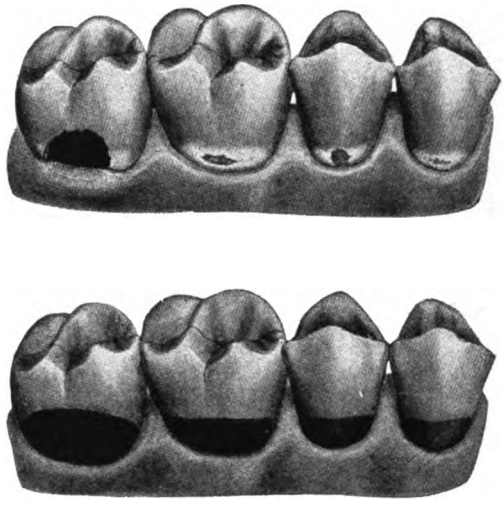


Fig. 6.

profession since the first discovery of anesthesia, and, perhaps, for many years before that time. Personally, I have watched the progress of this effort through many years of what has been fairly close, careful observation in clinical practice, and always with an earnest desire to relieve patients of suffering in the necessary cutting in the preparation of cavities. In all of this time, and up to the present, the results have been so poor, or so uncertain, that, as compared with skillful use of well-selected cutting instruments, well-tempered and always sharp, they have not been a success." The author concludes by saying: "But the relief of suffering is an ever-present duty, and the search for this very desirable thing should continue."

We can all readily appreciate that in order to practice modern dentistry and meet the demands of our patients it is absolutely necessary that we use some *real* obtunding remedy. Dr. Hart J. Goslee has long contended for certain principles in crown and bridgework. His system is recognized as the highest art in dental practice. In cases where an inlay is indicated as an abutment for a bridge, this author's experience

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has taught him to advocate anchoring such an attachment securely to the tooth. These inlays are frequently inserted in vital teeth, and their proper anchorage necessitates extensive drilling. Fig. 1, taken from Dr. Goslee's book, shows several illustrations of inlay attachments. Fig. 2, also from Dr. Goslee's book, shows one method of splinting loosened teeth. Fig. 3, taken from the articles of Dr. J. V. Conzett, shows the necessity, in the opinion of this well-known operator and writer, of



Fig. 7.

drilling into sound tooth structure for the purpose of anchoring inlays. Fig. 4, also from Dr. Conzett, shows another case of extensive drilling. For years Dr. F. E. Roach has been suggesting the use of certain hoods and attachments by which partial dentures and removable bridges can be satisfactorily anchored to vital teeth. Such procedures frequently require drilling into sound tooth structure. Fig. 5, from Dr. Roach, illustrates a lingual hood for a cuspid tooth.

I have here referred to three men in the profession who are recognized as leaders and who are known wherever dentistry is known for their genius and skill. These men have used Desensitizing Paste for months, even before the formula was perfected, and have given it every test. Do you wonder that they wax warm with enthusiasm when they find that by the use of this innocent remedy they can accomplish their work on vital teeth without the heretofore necessary pain. This is the field of the dentist of to-day. Let us turn for a moment to the work of yesterday.

Fig. 6, taken from Dr. Black's book, shows typical buccal gingival third decays in the upper bicuspids and first and second molars. In the second molar the decay has burrowed considerably in the dentin. The lower picture is the same case after operative treatment by Dr. Black, who is

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one of our highest authorities, and shows the extension and outline form of the prepared cavity. The author calls especial attention to the manner in which the cavity is extended gingivally so that the margin of the filling should lie under the free margin of the gum. We may not all fill these cavities to-day as Dr. Black advocates in his book, but certainly most of us have experienced the wisdom of following his cavity prepara-

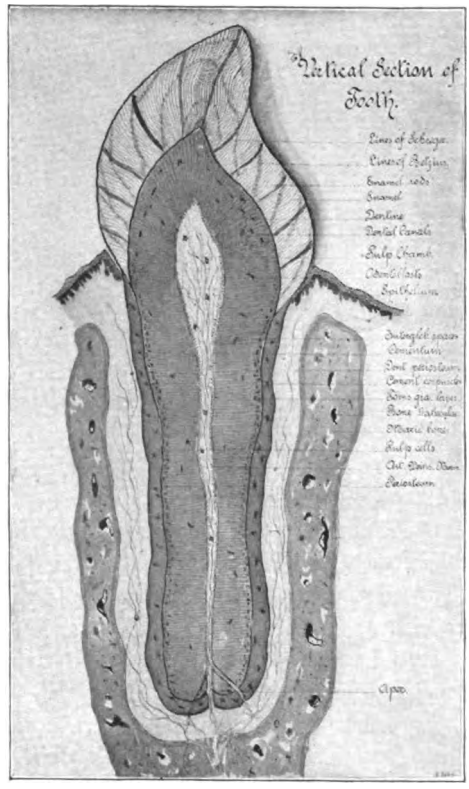


Fig. 8.

tion. In Fig. 7 we have another picture taken from the work of Dr. Black, showing the proper method of adjusting the Hatch clamp on a lower anterior tooth. Every dentist knows and every experienced patient well remembers the pain that is generally produced by such procedures. But this is not all. After the gum is forced back and the dam adjusted, the cavity is yet to be prepared and the gold to be malleted in. You may talk about the sharp, well-tempered bur, the steady hand, the smooth-running engine, your powers of suggestion, *et al;* but the patient who

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has had these cavities prepared knows that pain—excruciating pain in most instances—is produced. By giving us the cast gold inlay, Dr. W. H. Taggart, of Chicago, made it possible to fill these cavities without the clamp and rubber dam, and by using Desensitizing Paste they may be prepared absolutely without pain.

In mentioning these facts I want it distinctly understood that I am not decrying the use of the rubber dam where it is indicated, and, in my opinion, it is indicated in the tratment of all cases which involve the canals of the teeth. Too much emphasis cannot be placed upon the importance of treating the canals of teeth under the most aseptic pre-

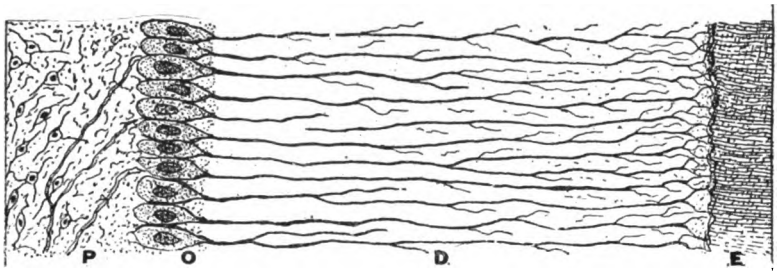


Fig. 9.

cautions. But such teeth, if badly decayed, may be built up with cement or matrices, when the adjustment of the rubber dam should cause no pain.

Directions for Using Desensitizing Paste.

In employing Desensitizing Paste, it is not necessary to remove any of the carious dentin that is at all sensitive. To attempt this often causes pain, and the remedy, if used at all, is intended to, and will, *absolutely eliminate all pain in cavity preparation.* The cavity and immediate tooth-surface should be dried with alcohol and a small amount of the paste sealed therein with a good cement. Better results will be obtained if the remedy is spread over the cavity surface. This can be accomplished with a ball of cotton held in the pliers. In gingival cavities, such as were illustrated in Fig. 6, it is often necessary to flow the cement over the enamel surface, depending entirely on its adhesiveness to hold the paste on the softened tooth structure.

Twenty-four to forty-eight hours is sufficiently long to bring about complete desensitization, and this is the proper length of time to leave the remedy sealed in a tooth. However, no harm will follow if the paste should remain in the tooth for a longer period. The small amount employed will soon exert its full influence, after which no further action follows. An effort should be made to hermetically seal all the margins of the cavity—thus confining the action of the remedy to the dentin. This

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is sometimes difficult to do with gingival cavities. If it is not accomplished, a certain amount of the formaldehyde gas may escape as it is liberated, in which case the dentin would not be so profoundly affected.

When it becomes necessary to prepare a cavity in practically sound dentin, as is frequently the case for bridgework and in superficial cavities, it may be necessary to make a second application of the paste in order



Fig. 10.

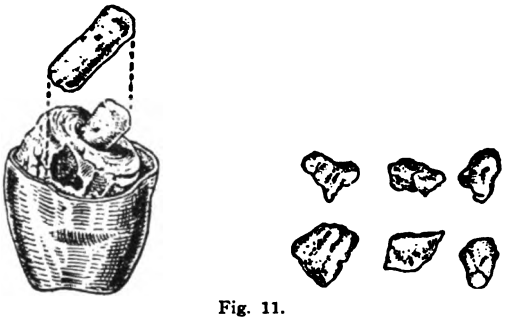


Fig. 11.

to avoid all pain. In all cases where there is considerable decay, one application will be sufficient to desensitize the entire cavity. The depth to which the dentin is affected by the remedy will depend upon the condition of the dentin.

Precautions. There are no special precautions to be observed in using Desensitizing Paste, so far as the remedy itself is concerned. It will not even destroy the gum tissue to any appreciable extent, at least, if sealed in contact with it. It will be necessary for the dentist, however, who desires to use this remedy intelligently to so school himself in pulp pathology that the remedy may not be used in those cases where the reading of the clinical symptoms would clearly indicate the removal of the pulp.

In deep-seated cavities which approximate the pulp, yet where the organ is not diseased to the extent of necessitating its removal, the paste need not be applied to the entire cavity. In these cases extra small doses may be placed over such areas only as will need to be drilled subsequently

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in the cavity preparation, and some anodyne remedy, like phenol compound, placed immediately over the pulp. The danger in using this preparation does not lie in the possibility of affecting deleteriously a healthy pulp, but rather in the probability of diseased pulps being left

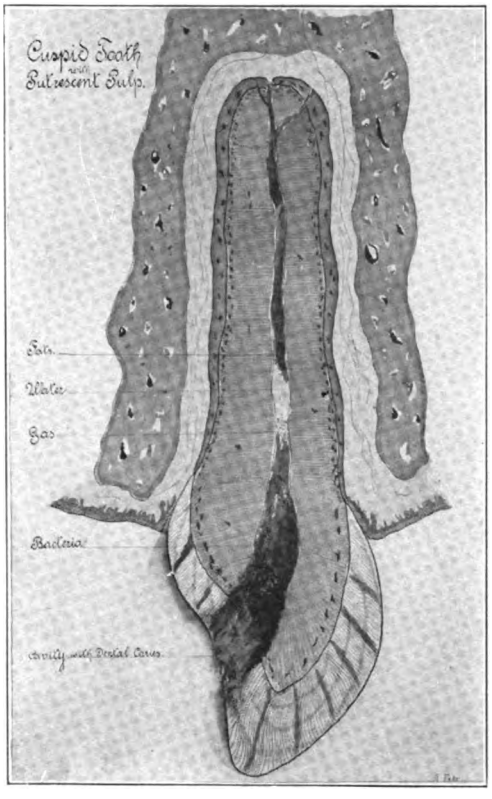


Fig. 12.

in teeth to die and putrify, because of the absence of sensation in the dentin after the remedy has been used. The decision, therefore, as to whether or not the pulp is diseased and removal necessary should be made before employing Desensitizing Paste.

In my clinical experimenting I have, at times, purposely used the paste in cavities of extensive decay, where I suspected the pulp was affected. At the subsequent sitting I was able to painlessly remove all of the carious dentin which extended very nearly and in some cases to the pulp. In those cases where the pulp was exposed it was found to be sensitive and would bleed freely, indicating, to my mind, that it had not been affected by the remedy. However, it is our plain duty in such

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cases as these to remove the pulp, for I do not believe that decay can extend to or nearly to the pulpal organ without the latter being affected by the carious process, if not infected by the germs present in the cavity.

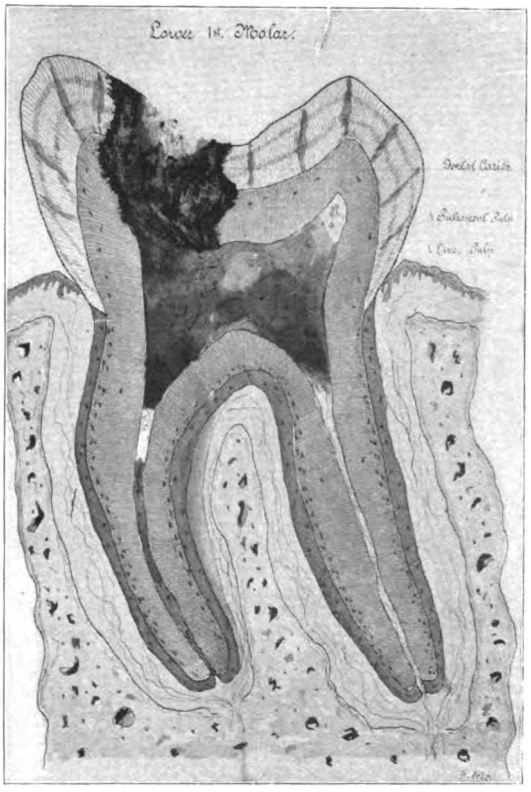


Fig. 13.

Antidote for Desensitizing Paste

The dental pulp is a delicate and susceptible tissue, and occasionally a tooth in which Desensitizing Paste has been sealed will grumble for a time even though the cavity is not deep and the pulp normal. This will not often happen if the diagnosis is correct, and the remedy has been used where it is indicated. Instead of this fact being an objection to the remedy, I feel that it is a distinct advantage, for it will serve as a check on the careless or indifferent operator, who is likely to use the preparation in nearly all cases regardless of the condition of the pulp. It makes the remedy automatic in its action and practically fool-proof. Should the paste be applied to a tooth in which the pulp is diseased it may make the tooth ache severely. In such a case

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the action of the remedy may be checked at once by applying *Aromatic Spirit of Ammonia* to the cavity on a pledget of cotton. After a moment or so the cavity may be dried and an anodyne dressing sealed therein or the pulp may be removed, according to the operator's judgment.

Pathology of Tooth Tissues.

In directing your attention to the use of this new remedy, I wish to emphasize in connection therewith the importance of a knowledge of the anatomy and histology of the tooth structure, as well as the pathology of the pulpal organ and dentinal fibrillae. Fig. 8 is an original slide taken from my own writings, and shows a vertical section of a lower cuspid tooth. Fig. 9, taken from Dr. Black, is a diagram illustrating sensation without nerves in the dentin. Here we see the pulp of a tooth with nerve endings in physiologic connection with the odontoblastic cells. The fibrillae of the dentin are prolongations of the odontoblasts, and any injury to them is an injury to a portion of the odontoblast and is transmitted by the nerve to the brain. Fig. 10 shows the best specimen of a pulp nodule that I have ever seen. The tooth is a lower third molar and was extracted because it was causing more or less trouble. There is but slight mechanical abrasion and no other known cause for the pathologic condition. Fig. 11 shows another pulp nodule, nearly one-quarter of an inch long, which fits the canal as perfectly as a pea fits a pod. The tooth for years had carried an ill-adjusted gold shell crown, which had been placed without devitalization and the proper trimming of the root. In this illustration also are shown several nodules of varying shapes and sizes, such as are commonly found in practice. These conditions result from certain constructive diseases of the pulp. Fig. 12 shows a gangrenous pulp, the result of an infection by saprophitic bacteria. The pulp has died from the destructive disease, and the canal is filled with intermediate and end-products of pulp decomposition, but no pus. Fig. 13 illustrates how we may find the pulp tissue gangrenous in one or more canals of a multi-rooted tooth and vital in the other one or two canals, the result of an infection also, and a destructive disease.

Time will not permit me to discuss here in detail the various diseases of the pulp. This I did in a paper read before the Chicago Dental Society last December and published in the March, 1914, number of the *Dental Review*, and from this paper many of these illustrations are taken. While it is true, generally speaking, that pulps which are diseased beyond the condition of active hyperemia should be removed; it is also true that this organ has been destroyed far too ruthlessly in the past. The work of Rosenow and the observations of Hunter, Murphy, Billings, and others of the medical profession, and the investigations of Grieves, Rhein, Cook, Moorehead, Hartzell, and others of our own profession,

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along the line of periapical infections and the systemic results, should teach us to conserve the dental pulp in every case where it is practicable and consistent with good dentistry. Thousands upon thousands of normal pulps have been sacrificed for no other reason than that the dentin of the tooth was hypersensitive. When we think of the difficulty—not to mention the carelessness—under which these pulps are often removed, and of the frequent periapical infections resulting therefrom, we behold a sad spectacle indeed. Desensitizing Paste will not only eliminate pain in filling vital teeth, but it will also be the means of saving these pulps, which, under similar conditions, heretofore have been destroyed.

Caution in Relation to Death of Pulps.

In offering this valuable remedy to the profession, I wish specifically to call attention to the fact that every dentist has had cases in his practice where vital teeth have ached after permanent fillings have been inserted, and that pulps die occasionally following these operations. Unless the dentist is well posted on pulp pathology and cautious in his diagnosis, similar experiences will follow the use of Desensitizing Paste. If such should be the case, however, it will be through no fault of the remedy—it will be the fault of mistaken diagnosis. I can understand how much harm can follow the use of any remedy or method by which cavities can be painlessly prepared. In the hands of the careless operator, pulps may be left in which should have been removed. In the hands of that great army of conscientious practitioners, who constitute the vast majority, Desensitizing Paste will lighten their burdens and prove its worth. I repeat that in the hands of such men this remedy will be a God-send and a great benefit to suffering humanity.

In my clinical experimental work with this remedy I have been seriously handicapped, for the reason that my private practice is largely a special one; and, therefore, I do not have the opportunity of using such a remedy to the extent that a general practitioner would have. I did not wish to rely wholly upon the students in college for clinical data; therefore, before the formula was perfected I took certain men into my confidence, told them what I was doing, and, placing the remedy in their hands I asked them to try it in their practice, note the bad results, if any, as well as the good, and report to me. This was done to confirm my own experience with the remedy. Everyone of these men who made a report at all were so enthusiastic that I was both pleased and encouraged. I desire at this time to thank Dr. J. V. Conzett, of Dubuque, Iowa; Dr. R. Ottolengui, of New York; Drs. Hart J. Goslee, F. E. Roach, E. W. Elliot, D. M. Gallie, J. E. Keefe, C. N. Johnson, L. S. Tenney,

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C. E. Bentley, E. A. Crane, of Chicago, and others, for their aid and assistance.

In closing I want to say that the dread of the dental chair, the severe nervous strain upon dentists, the failures of operative procedures upon vital teeth, and the ruthless destruction of the dental pulp, with its frequent evil sequelae, have been due more to hypersensitive dentin than all other causes combined. It is a great pleasure and satisfaction, therefore, for me to present this formal paper for the first time on Desensitizing Paste before the Second District Dental Society of New York.

President's Address.

By William H. Gelston, D.D.S., Camden, N. J.

Read before the New Jersey State Dental Society at Ocean Grove, July, 1914.

To the Members and Guests of the New Jersey Dental Society:

It is my privilege and honor to welcome you to our forty-fourth annual convention.

A new era has dawned for the New Jersey State Dental Society, and when this convention will have passed into history, then, and only then, will the members who have had the good fortune to attend the whole of this session realize what the various committees have accomplished, that you might take home with you the knowledge and new appurtenances that will assist in giving to your clientele the latest and best.

Words are inadequate to express my appreciation of the results accomplished by those who have labored so arduously that this meeting might go down in history as a successful new departure from the old methods of holding conventions. It is therefore with inexpressible gratefulness, as the representative of this society, that I would thank the chairmen of the various committees, and each and every individual that has assisted and is still working for this consummation so devoutly to be wished.

The new departure from the old method of holding conventions will, we believe, give an incentive to our members that will procure their attendance throughout the whole of the session, that would otherwise be impossible to attain. In the past, members could attend the one big day of clinics, return to their homes, and wait for the papers and discussions to be published in the magazines. This year we have progressive essays and progressive clinics which will not be published, and which can be obtained only by the same methods by which college lectures are obtained,

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i. e., by attendance. They essay committee is to be congratulated upon their success in securing such eminent authorities in their course of progressive essays, which will be of inestimable value to those who wish conscientiously to serve the public. As we all know, the crown or filling may be the most beautiful and artistic work of an expert, but if done without the knowledge that is necessary for the successful treatment and filling of pulpless teeth, the work is in vain. The Clinic Committee, likewise, is to be congratulated upon their success in procuring progressive clinics. Admission to these clinics, like the progressive essays, can be obtained only through membership. With such inducements, it is but a question of a short time when only the Rip Van Winkles will not be knocking for admittance to our society. We have been considering inviting members from other State Societies as guests of the New Jersey State Society to these post-graduate courses. You already have cognizance of what your exhibit committee has been doing; this exhibit is the largest and most artistically arranged of any ever staged by this society. The program, press, registration, electrical and publicity committees have given an excellent account of themselves. The remainder of the committees will be heard from later in the session, and will give as good an account of themselves as the above mentioned.

Reorganization.

It has been stated that co-operation is the life of trade. We are sure co-operation has given us a convention such as this society has never before enjoyed. Your officers, having in mind reorganization, carried out the principal of local representation on the various committees in so far as it was possible so to do. At your last session a minute was passed that the Executive Committee and a member from each local society (who is also a member of the State society) constitute a committee on reorganization. I would recommend to you that this committee be continued for another year and that it also include your Secretary, Treasurer and Advisory Committee, as these officers were on the original committee for reorganization and their advice and experience would be of inestimable value.

Owing to the depleted condition of our treasury your officers deemed it unwise to secure counsel for the purpose of drafting a new constitution and by-laws at this time. The best business principles, therefore, the best interest of the society could be better served by postponing reorganization for another year. Then with a clean page on the debit side of ledger we will be in a position to effect, without further embarrassing our society, the much desired reorganization.

It is possible to attain a portion of this desideratum by enlarging

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our executive and membership committees that different portions of the State may be represented on both. I would, therefore, recommend to you the amending of Article III of the Constitution, striking out the word "four" and substituting the word "thirteen," so as to read: "executive committee of thirteen members," A committee on membership to consist of five members, striking out the word "five" and substituting the word "thirteen," so as to read: "and a committee on membership to consist of thirteen members."

If reorganization is consumated next year our new members will become members of our State society through the local societies, no initiation fee being required. Had our financial condition permitted this change it would without doubt have occurred this year. To continue our good faith and give this year's applicants for membership a square deal, I would recommend to you the amending of Article V of the By-laws, striking out "The initiation fee shall be five dollars," and substituting—"an initiation fee of five dollars shall be collected from all applicants who are not members of a local society." And amend Article II of the by-laws to read: "and accompanied by the initiation fee of five dollars if said applicant is not a member of a local society."

Law suits are an expense which should be avoided wherever possible. Our constitution states, Article VII, Section I of the by-laws: "the regular meeting of this society shall be held annually at (————), commencing on the third Wednesday of July at 10 o'clock A. M." While in session last July this body deemed it wise to change the date of this year's meeting to the fourth Wednesday in July, that our convention might not conflict with that of the National Association. Later the date of the National was changed one week, which necessitated the calling of a special meeting to rescind the original motion of change of date that we might hold our convention as the constitution provided. To prevent all legal controversy and complications of calling special meetings, I would recommend the amending of Article VII, Section I, striking out "commencing on the third Wednesday of July at 10 o'clock A. M.", substituting "the annual meeting of this society shall be held in July, the dates and place to be selected by the Executive Committee."

Trust Fund Committee.

At the session of one thousand nine hundred and nine a minute was passed creating a committee and trust fund for the relief of indigent members. This committee, the motion so states, is to be "a permanent one to report to the society annually." There has been some controversy in the past as to the interpretation of this resolution. At vour last session Dr. William I. Thompson, your presiding officer, asked

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for a ratification of the appointment of Dr. Truex to fill the vacancy caused by the death of Dr. Stockton, and Dr. Jones as treasurer to fill the office left vacant by Dr. Truex appointed as chairman. The legality of these appointments had been questioned by members of the committee, who assumed that the officers and members had been appointed for life. That there may be no further controversy I will ask the society to construe the meaning of the motion, *"Resolved,* That the President, before the close of this meeting, appoint a committee of ten members to report at the 1910 meeting concerning the creation of a trust fund by subscription or by an advance in the dues, for the systematic relief of members of the State Society only, who have been active members for not less than ten years and who may be in want and that this committee be a permanent one and to report to the society annually." You are asked to construe the clause "and that this committee be a permanent one, to report to the society annually." Is it the committee that is to be permanent or the personnel of that committee?

No financial institution elects its officers nor hires an employee for life; that would be decidedly poor business. Have we minutes on our books that will prove what has been stated of our profession, that we are the poorest kind of business men? The above clause states that there shall be an annual report; the society's minutes show no report from the creation of this committee in 1909 until 1912. That is poor business. Members of this committee inform me that they never received notice of a meeting, that is poor business. The secretary informs me up to date (February 2, 1914) no minute book has been procured (that is decidedly poor business), but that the minutes were as follows; that the society may have a record of the proceedings of this committee they are herewith given in full:

"Trust Fund for Aged and Indigent Dentists, July 21, 1909. Committee met and organized. Quorum present. July 18th, 1912. Committee met. Quorum present. Treasurer was ordered to pay one hundred dollars to a member. Order paid. July 17th, 1913. Committee met. Quorum present. Treasurer was ordered to pay one hundred dollars to a member. Order paid."

You will note that there was no meeting of this financial institution from 1909 to 1912 when the committee reported to the society $429.04 in bank. You will also note that there is no record of this committee having met to consider plans for the investment of this fund in gilt-edged securities up to 1913, when your society borrowed $818.00 of this fund. This is decidedly poor business. No reflection, however, is cast upon your chairman who was appointed in 1913. There is, however, a reflection on

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a society that will allow such unbusiness-like methods to exist. Therefore, if you decide that the personnel of this committee has been appointed for life, I would recommend that the motion creating that committee be rescinded, and that it be made a committee to be appointed annually.

New Jersey Dental Journal.

Almost all State dental societies issue a quarterly bulletin, keeping the members in touch with the society. *The New Jersey Dental Journal* is issued monthly in the interests of our State and local societies. We have reason to be very proud of this journal. In March the Publication Committee presented this society with one hundred dollars from their net proceeds. While the journal is published in the interest of our State Society it has never been officially recognized by this body. As it is not a burden, but a financial asset, a means of keeping the members in touch with the State and local societies, and incomparably better than a quarterly bulletin, I would recommend that a motion be passed whereby this journal may become the property of this society and its official organ.

Resolutions of Appreciation of Services of C. F. Jones.

A past disagreement among members financially embarrassed our society; collections from subscriptions did not meet our obligations by hundreds of dollars. A good Samaritan, however, came forward, assuming all our liabilities with his personal check. This was no other than our genial treasurer, Dr. Charles F. Jones. I would, therefore, suggest that a committee be appointed to draft suitable resolutions to be spread upon our minutes in recognition of the services rendered.

Affiliation with National Dental Association.

The time is at hand when we should consider the question of affiliating with the National Dental Association. The dental profession has been entitled to recognition as a specialty of medicine. The National Dental Association can and will accomplish more than this, with the support of every State in the Union. The Scientific Foundation and Research Commission, through Dr. Hartzell, has produced in animals typical joint, heart, kidney and aorta lesions by inoculations with cultures taken from dental foci. What this committee alone is doing would repay you many-fold for affiliation. The metallurgical researches will save a considerable sum of money to the profession if you are looking at the financial side.

Dr. Homer C. Brown states "the world's famous surgeon, Dr. Chas. W. Mayo," closed a very interesting paper as follows: "The next great step in solving the question of preventive medicine must be taken by the

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dentists. The question is, will they do it?" They have done it and are going to do more. As the New Jersey State Dental Society do we intend to help. I would recommend that we pass a resolution to become a constituent society of the National Dental Association.

Dental Health Board Members Recommended.

Our profession being a specialty of medicine we must assume the responsibilities that always accompany recognition. It is gratifying to see the interest taken, and the number responding, volunteering their services in establishing free dental clinics and helping to educate the public in the Oral Hygiene propaganda. We cannot, however, be satisfied with the present status: this profession should be represented on the State Board of Health. Having recognized the responsibility resting upon us for the prevention of many serious systemic infections it is our duty to call the attention of the Governor to these facts, that he may recognize the advisability of placing a member of our profession on the board. I would, therefore, recommend that a committee be appointed for that purpose.

Annual Registration with Fee Recommended.

Ways and means for the elimination of the illegal practitioner in our State; and our State Board of Registration and Examination with its present requirements, will necessitate your close attention.

In the April number of the *New Jersey Dental Journal,* there appeared under the title, "The Illegal Practitioner," an ill-advised article by the president of our State Board of Dental Examiners, stating to all the dental world that the Board was "broke" and that there were already two hundred illegal practitioners in the State, which condition they were powerless to correct. In other words, like the dog that is whipped and turns up to the enemy, the Board says, "We give in, help yourself." If the dental law is a by-word to be laughed at by illegal practitioners, and the president of the Board admits they are powerless to prevent such a condition to such an extent as to rush into print and so announce, it would be better for that president or Board to resign than to put the honest young men to the expense of an examination and allow the charlatan to ply his nefarious business undisturbed.

The officers of your society have decided that something can be accomplished to prevent this condition and called a joint meeting with the State Board; also asking each member for a set of their examination questions. The president of the Board tried to see some connection between attendance and the questions, stating he could see none, and declined to attend. All the other members being present, a plan was evolved for collecting a

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sufficient sum to commence prosecution. It was also unanimously decided that a published list of all licensed practitioners in the State, with college, year of graduation, number of license, when issued and latest residence known would be a great help to detect infractions. An hour of cross-questioning the acting secretary brought forth the fact that it would be possible to get out such a list within a month. Upon learning of the instructions given the acting secretary by the Board, the president of that body wrote our secretary that it would cost us fifteen dollars to get out such a list, and we have assisted that Board to the amount of five hundred dollars at a time to prosecute illegal practitioners. Gentlemen, your Board still needs renovating. The receipts from this society should be spent for that which will educate and elevate its members. If these funds are more than sufficient, reduce your dues and give your members the benefit. Every licensed practitioner in the State should be willing to pay a nominal fee each year to assist in protecting the fair name of the State in which he resides and for the uplift of his chosen profession. This society should not be required to bear the burden of that which is of equal protection to non-members.

If you expect to stop the illegal practice of dentistry in the State it must be done on a business basis and not by filing a report that the receipts were $2,616.11 and the incidentals were $2,263.83; nor by taking cognizance of a case in the opposite end of the State, and taking no action in a case in the resident city. You can make your own inferences. If there are two hundred illegal practitioners in the State it proves that your present methods are very defective. Means must be provided whereby this blot will be eradicated for the protection of the citizens and of our profession.

I would, therefore, recommend an annual registration license, with a fee of not less than two nor more than five dollars, the amount of said fee to be determined by the Legislative Committee after careful computation of the expense necessary for inspection and annual license, after the plan of the department of motor vehicle registration and regulation. The proceeds of this fund must be used for the purpose of prosecuting illegal practitioners.

Certain recommendations to the Legislative Committee were passed upon by this body at our last session, increasing the number of examiners on the Board of Registration and Examination in Dentistry, including five other recommendations. If any of the present recommendations conflict with those already passed, I would advise that the Legislative Committee in conjunction with the Executive Committee be given the power to select those best suited. Or by the incorporation of a part or

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all of those different recommendations to effect their several particular needs.

Dental Education, Examinations and Requirements.

The preliminary requirements have been raised to a four-year high school course which is excellent to a certain point. The practical requirements are the same as they have been for the last twenty odd years with one exception in prosthesis, *i. e.*, the soldering of a three-tooth bridge to supersede a full upper denture, which was an *innovation* (the italics are mine), so called, by a former examiner. Stop and consider for a moment the field of prosthetic dentistry, and the absurdity of permitting an applicant to practice that whole field on the success of soldering a little three-tooth bridge. The theoretical examinations, the questions of which I have been permitted by certain members of the Board to examine, are very fair. I would thank the gentlemen from Morris, Hudson and Camden counties for their assistance. Practical operative dentistry covers too small a field. The successful insertion of one gold approximal filling and one amalgam filling proclaims the candidate proficient to practice upon the dear, confiding public, until the said public becomes discouraged with operative dentistry and seeks exodontia for relief. Said relief may happen to be rendered by another newly licensed practitioner, who has never yet administered profound anesthesia. These, gentlemen, are the conditions existing to-day under our requirements to practice dentistry. Where lies the responsibility? In the colleges? No. They cannot get sufficient material for practical work. The responsibility lies with us. I stated that a four-year high school preliminary course is excellent to a certain extent. If the four-year course ends all preliminary requirements other than a dental college diploma, you have missed the mark for which you aimed. All other things being equal, give me a young man with a two-year high school course and dental college diploma and at the end of two years more in my office, I will give you a practitioner fifty per cent. better equipped for practice than the four-year high school student. You should have no lower standard for your preliminary requirements, but you should have a much higher standard for your practical requirements. The free dental clinics, and assistant operative positions with a legal practitioner, make excellent openings for the placing of candidates wishing to practice in this State. Allow them to take the theoretical examinations immediately after leaving college, but not the practical until after they have been placed as an assistant for one year, then to be examined on up-to-date operative and prosthetic dentistry. I would, therefore, recommend the amending of the preliminary education law to include one year of practice before or after graduation, in a legal dental office or dispensary, sanctioned by the Board of Examiners.

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Death of Chas. A. Meeker.

The year 1914 makes it necessary to record with regret the death of another of our oldest members. I refer to Dr. Charles A. Meeker, who for thirty-six years was secretary of this organization. I would recommend that a committee of five be appointed to draw up suitable resolutions to be sent to the family of the deceased, and that a copy be spread upon the minutes of this society.

I thank you for your close attention.

Report on Principles of Cavity Preparation.

By H. W. P. Bennette, M.D.S. (Liv.), L.D.S., England, Birkenhead

Section III. Sixth International Dental Congress, London, August, 1914.

It does not enter into the province of this paper to discuss the advantages or disadvantages of the cast gold inlay as compared with the foil filling, nor do I intend to do so, beyond stating my belief that the cast inlay affords us a better means of restoring to full functional activity any tooth which has been attacked to any appreciable extent by caries, than does the foil filling.

It must not be understood by this that I have discarded the foil filling, but that I have limited its use to small cavities which have a box-like formation; that is to say, four walls and a floor, and which do not call for a contour restoration.

For convenience of description I will divide the types of cavities into three groups:

(*a*) Those rendered necessary, or brought into being by imperfections in development, such as fissure cavities or pits.

(*b*) Those which occur upon smooth surfaces.

(*c*) Those which involve both of the above.

In group (*a*) I use the words, "rendered necessary by imperfections in development"; wishing to imply that I do not hesitate to cut out faulty fissures or pits, even though they are not as yet seats of caries.

The reason for treating carious teeth are two, namely, the removal of diseased tissues, and secondly, the restoration in full of these lost tissues.

Bearing this in mind I invariably divide my operation strictly into two sections, and therefore never commence to shape up a cavity until I have completely removed all affected parts.

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Technique of Cavity Preparation.

The first step in the operation is to break down all frail enamel margins by means of a freshly sharpened chisel, cutting until hard, healthy enamel is reached in every direction.

When this has been done, as much of the carious dentin as can be removed by the use of excavators is cut away, the cutting being done from points near the centre of the cavity toward the circumference in order to avoid undue pressure and consequent pain being inflicted upon the pulp.

When it becomes difficult to remove partly infected dentin by this operation, a suitable rose head bur is used and by this means all unhealthy dentin is removed. If at this stage any overhanging enamel margins are present, they should be removed by means of a convenient sized carborundum stone moistened and used with a light steady touch while revolving rapidly in a true running handpiece.

I use stones in preference to burs for all trimming of enamel margins, as I consider they cut better and are less painful to the patient—to say nothing of the speed the work can be done at, and the finished surfaces they give. Small knife-edged stones used in either the straight or contra angle handpiece are particularly useful for opening up fissures especially where there is little or no caries present.

At this stage, and not before, should the shape of the cavity and the position of the cavity margins be finally decided upon. At this point, also, pulp or root treatment, as the case may be, should be taken in hand, and, generally speaking, completed before passing on to the rest of the operation of preparing the cavity for the reception of the inlay.

The above description serves for every form of cavity met with.

It would be quite impossible in a paper of this length to go into the minute details in the preparation of even all the most typical cavities we have to deal with. I shall therefore attempt so to word my description as to cover the majority of them.

Cavity Margins.

First, let us consider a typical case in group (*a*). Assuming that all infected tissue has been removed, and leaving out of consideration any pulp or canal treatment, we must decide upon the position to be occupied by the cavity margins.

Here, as in all cases, due regard must be paid to the chance of the recurrence of decay, and the joint between healthy tooth and metallic restoration must lie in the region of comparative immunity. This on all occlusal surfaces is, practically speaking, at every point, except the de-

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fective fissures, so that when these have been freely cut away the cavity margin occupies a position of safety. Sharp corners, such as lie at the junction of the fissures, should be rounded off in order to simplify the cavity as much as possible.

Cavity Walls.

This being done, the next step is to shape up the walls of the cavity. The floor, or pulpal wall, should be made as flat as possible, and the remaining walls should be as near a right angle to this as it is convenient to make them. In practice this angle will be slightly obtuse; but it is wise to make it as little so as possible.

The best procedures in my hands for bringing this about is first to cut the floor with the face of an inverted cone, but taking care not to undercut the walls. Then proceed with Dall's inlay bur and finish off with either a drum-shaped stone or else with an old fissure bur covered with moistened carborundum powder. This gives a smooth surface, and insures cutting the face of the wall in its entire depth at one time.

The angles made by the walls perpendicular with each other should be rounded and should follow the line created by the margin of the cavity.

Testing Cavity Form.

At this point, if I have any doubt about being able to withdraw my wax pattern, I soften some gutta-percha and force it into the previously moistened cavity; let it stiffen and then carefully remove by fixing a heated sprue, which, when cold, can be seized by dressing-pliers. If it leaves the cavity easily, all is well, and in any case, a careful examination of the plug often suggests some slight modification or improvement in the shaping of the cavity.

Cavo-Surface Angle.

The last step, but a most important one, is the treatment of the cavo-surface angle, and with Dr. J. V. Conzett and others I lay particular stress upon this part of the preparation. I prefer a long bevel taking in the whole thickness of the enamel.

This requires care and a good deal of patience. In the type of cavity at present under discussion, I find a cone, or drum-shaped stone of great use.

When this surface is carefully polished I consider the cavity is ready to receive the wax from which the matrix is to be made.

This paper is not concerned with this part of the procedure, but it is well to examine the pattern when obtained and to learn from it whether

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the cavity preparation is all that it should be or not, and if not it can still be remedied.

Quite a common complication of this simple class of cavity is where a defective groove extends over the buccal or lingual surface of the tooth.

In this case the treatment is the same. The pulpal wall is extended and becomes the floor of the groove, the walls are at right angles to it and the cavo-surface angle is bevelled. Obviously the occlusal end of this groove is wider than that which approaches the gingival margin, for the convenience of withdrawing the wax pattern. In those cases where this groove leads into a pit which when cut out is larger than the width of the groove, I prefer to treat is as a separate cavity rather than to sacrifice too much healthy tooth substance.

The pits formed on the lingual surfaces of the upper incisors need no more description than the above, as they should be simple box cavities.

We pass now to those cavities which occur upon smooth surfaces. Very little further description is required for this type of cavity.

Labial and Buccal Cavities.

The most common examples are those which are situated at the gingival margin on the labial surfaces of incisors and cuspids, and the buccal surfaces of premolars and molars.

Here the floor or pulpal wall should be flat and the surrounding walls at right angles to it, and the cavo-surface angle bevelled, except in the region where the cavity margin passes beneath the gum. Here I prefer a face joint, for the simple reason that it can be practically finished out of the cavity, and thus avoid damage to the soft tissues; it also occupies a region of immunity.

The only cavities on the mesial or distal surfaces that I treat in the above way are those which are situated in teeth which have lost their neighbors, and where the enamel and dentin on the occlusal boundary are strong and healthy.

All other cavities which have their origin on these surfaces I open up to the occlusal surface and treat from there.

Occluso-Proximal Cavities.

One description for all mesio- or disto-occlusal cavities must suffice.

All defective tissues having been removed, the cavity margins are extended to those regions which are comparatively immune from decay.

The gingival margin should occupy a place just beneath the gum and the buccal and lingual margins, which should be parallel or slightly divergent at their occlusal ends, should meet it in slightly rounded off

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angles. The occlusal margin will depend upon its position and the condition of the fissures on that surface.

If these are involved they must be cut out as described above and the two cavities must merge into one another.

The gingival wall should be cut flat at right-angles to the long axis of the tooth and the pulpal wall should meet this at a right-angle. The gingival wall may here be considered as the floor of this portion of the cavity. The remaining two walls, buccal and lingual, should meet both the gingival and pulpal at right-angles, or if there be sufficient tooth substance to allow of it without risk of weakening, these two walls may occupy a position at an angle which is slightly acute with the pulpal wall. If this is not possible or is undesirable, anchorage may be obtained in most cases by either broadening the end of the fissure or occlusal portion of the cavity which is distant from the main portion, or drilling a depression in the pulpal wall of this portion of the cavity.

When this is done nothing remains but to create the cavo-surface bevel and take a test wax pattern.

The object is to so form the cavity that the wax matrix can be withdrawn from it in an occlusal direction.

If the fissures are not involved, I find the simplest form of retention is to make the bucco- and linguo-axial angles slightly acute, and if possible increase this tendency as the occlusal surface is reached. This, together with a flat gingival floor, an accurate contact point restoration, and good occlusion is sufficient to retain any medium-sized inlay in this position.

If the root canals have been treated, additional retention can be obtained from this source by means of a post of iridio-platinum wire around which the inlay can be cast.

M. O. D. Cavities.

In those cases where both the mesial and distal surfaces are involved, it is necessary to make one complicated cavity.

The preparation is the same with this addition. The cusps are deliberately reduced, so that they may be reproduced in gold.

This is particularly necessary in the case of upper premolars. In this way the risk of splitting either half of the tooth during mastication is reduced to a minimum.

Approximal Cavities.

It only remains now to give a brief description of the preparation of cavities situated in the approximal regions in the anterior teeth.

Generally speaking, these cavities can be made fairly simple by quite freely opening them up from the lingual aspect.

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The margins are extended in every direction until the safety line is reached. If the cavity is one which does not involve the incisal edge, sufficient retention can be obtained by preparing it as follows:

The gingival margin is placed beneath the interdental portion of the gum tissue, and merges into the labial margin which extends as far as the mesio- or disto-lingual angle of the tooth. The lingual margin is brought into existence by the preparation of the pulpal or axial floor.

The gingival wall is shaped so as to be at right-angles with the long axis of the tooth, and the axial wall is made at right angles to the gingival wall. This is accomplished by opening up the cavity from the lingual aspect with small stones or fissure burs held in the contra angle handpiece, great care being taken not to remove all healthy dentine from the back of the labial wall. This operation virtually forms the labial wall which thus makes a right-angle with the axial wall. It will be seen also that this forms the lingual margin of the cavity. Sufficient retention can then be obtained by prolonging the lingual margin and the portion of the axial wall adjacent to it, both in the direction of the root and the incisal edge of the tooth—thus forming a dovetail.

This portion of the margin and a small portion of the extremities of the labial and gingival margins can then be bevelled and the cavity is ready for the trial wax pattern.

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Second District Dental Society of the State of New York.

A regular meeting of the Second District Dental Society, of the State of New York, was held on Monday evening, October 12, 1914, at the King's County Medical Library Building, 1313 Bedford Avenue, Brooklyn, N. Y.

The president, Dr. Stevenson, occupied the chair, and called the meeting to order.

Dr. J. B. Buckley, of Chicago, read the paper of the evening.

Discussion of Dr. Buckley's Paper.

Dr. Hart J. Goslee, of Chicago.

Of the many dental meetings which it has been my pleasure to attend, none has gratified me more than when visiting the Second District Dental Society of the State of New York. Indeed, it has been my privilege to be with you so often that, as I took occasion to say to you the last time I was here, I am beginning to feel quite at home in your midst; and why should I not, when only a little while ago one of your officers came up to me and asked me if my dues had been paid? (Laughter.)

It seems to me, if you will permit me to speak in the first person singular, that I have been signally fortunate. It was my especial privilege and pleasure to come to New York seven years ago, to make an effort toward opening the discussion of a paper by Dr. W. H. Taggart, which was revolutionary in its character, and which changed the whole aspect of the art side of dentistry. I shall always look back upon that occasion with pleasure and keen gratification—to think I should have enjoyed that privilege. I can remember very well when I came with Dr. Taggart and was met at the train by Dr. Ottolengui, the eagerness with which

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Dr. Ottolengui wanted to know what Dr. Taggart had to give to the profession at that time. He could hardly wait until he got us up to his home, when he insisted upon knowing what Dr. Taggart had, and when he saw, he looked at him with amazement and said: "Why, Taggart, we have now reached the era of painless dentistry." Little did he realize, perhaps, that that era was so close upon us. It is true that the introduction of the cast inlay made it possible for us to do better work with far less pain to our patients than had ever been possible before; but from to-night on, ladies and gentlemen, we can go far, far beyond that.

The highest achievement I think that lies within the power of mankind is to reduce or eliminate pain, and I believe that Dr. Buckley deserves a monument for having introduced to us a remedy which I can say to you from personal experience absolutely does everything which he claims for it.

I have been so fortunate as to enjoy his close friendship, and, as he has told you, to help him in a very small way in ascertaining whether what he hoped this remedy would really accomplish could be done. Enjoying that friendship, I gave him every possible encouragement, and I felt most happy when he selected me among the few he chose to try this out.

In the few months I have had it I have used it in 126 cases, as I told Dr. Buckley for the first time yesterday on the train, and I can report 100 per cent. of absolute success. Indeed, I do not think failure is possible. These 126 cases mean necessarily that I have used it almost everywhere—in all classes of patients and cavities—and in not one single case have I been disappointed in its effectiveness or in the result it produced, beyond the fact that two conditions sometimes presented: one was, that a second application became necessary in three or four cases, in order to permit me to extend the cavity preparation to the desired areas. The other was the aching of the tooth. In some seven of eight cases, the patients complained when they came back the next day or the day after that the tooth had ached severely. That may have been my fault. I might have placed it where some kind of preliminary treatment—an anodyne or something of a soothing nature should have been used. In each of these instances, however, after preparing the cavity without pain to them, and progressing a little further to other work in the mouth, I said: "Shall I try to prepare this cavity without applying the desensitizing paste or shall I just go ahead and use the paste as in the other cavity?" and in each instance the patient said, "Doctor, put in the paste" (laughter), which indicates to me that the ache was not quite as severe as they would have me believe.

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I am happy to take advantage of the opportunity to come here and participate in a small way in the presentation of this remarkable achievement to-night, and it will be far more revolutionary, I believe, even than was the achievement presented by Dr. Taggart seven years ago. We have, indeed, now reached the era of painless dentistry, not of the kind of which we have heard so long from the charlatan, but absolutely sincere, earnest, ethical and scientific painless dentistry. That is what Dr. Buckley has brought to you to-night, and again I am forced to say that I am pleased to be here and attest to the fact that you can rely absolutely on what he has said.

Dr. W. D. Tracy, New York City.

The paper Dr. Buckley has presented to-night is only another evidence of his devotion to his professional work. It is another contribution from him which will make us more deeply indebted to him than before.

A few days ago Dr. Hyatt was kind enough to place in my hands a small quantity of the paste and I have used it in about a dozen cases. The range of its use was quite wide within those few days, and the results obtained interested me very much. In no instance did I fail to get some result. In every instance but one I obtained the desired result, and was enabled to excavate my cavity—completing the work without pain to the patient. The cavity which gave me trouble was a shallow, cervical cavity in a lower second molar, and in endeavoring to place the paste, I perhaps failed to seal it properly in the tooth.

Dr. Buckley told me to-night that there is sometimes a failure to produce a desensitizing effect when the cavity is in such a position that the paste cannot be properly sealed in it.

Dr. Buckley has never failed us. Those of us who have used his preparations have always found them to be as he represented. We are all glad to get this paste, and I feel sure it will take an important place in the list of Dr. Buckley's preparations.

It seems a cruel fate that this splendid thing should be presented to us after some of us have equipped ourselves with hypodermic syringes, and have mastered the intricate technique of nerve-blocking and all those things which are necessary to produce local anesthesia. As for the excavation of sensitive cavities, however, it seems that the application of this paste will be unlimited when the operator has the opportunity to make the preliminary application. One of the interesting points in the paper was, that when we are ready to fill our cavity after having used the paste, we may feel assured the dentine and the fibrillæ have been thoroughly disinfected, and that the cavity is really ready for the filling.

The odontalgia caused by the use of the paste is hardly a factor. In

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only one out of the twelve cases did I have any complaint, and that was a hypersensitive cavity, and the patient complained only of a discomfort in the afternoon, and not at all later, nor during the night.

This paste, perhaps, does not differ from our other remedies in that we must employ common sense in its use. I do not think we need to reckon with that element in our profession who do not act with care and with conscience, because they really do not represent the profession and may be counted on to misuse any remedy.

Dr. Buckley has made it plain that the active ingredient that does the work is the formalin in the compound.

I feel that the evening has been a most profitable one, and I want to express my personal debt to you, Dr. Buckley, and my congratulations to the society, on having received this epoch-making paper.

Dr. W. B. Dunning, New York City.

Painless dentistry has been such a will-o'-the-wisp for so many years, that the presentation we have had to-night seems almost too good to be true. I think that is the first thought that strikes us; and then on second thought, the fact that it is Dr. Buckley who presents this wonderful preparation goes a long way toward removing any misgivings which may be suggested in its use.

We are all indebted heavily to Dr. Buckley for the preparation of formo-cresol he put forth some years ago for the treatment of putrescent pulps, which practically revolutionized the treatment of those cases. All humanity has benefitted by it. From his other preparations we have gained confidence in everything he presents. Perhaps, therefore, I shall appear to you to-night like a doubting Thomas, for I have been afraid to use this preparation without knowing more about it. Dr. Hyatt kindly supplied me with a small quantity, with the request that I try it. My associate tried it in what seemed a favorable case, and the next day, by the ordinary tests, he was unable to decide on the vitality of the tooth.

Of course, we all know the diagnostic importance of pain, as Dr. Buckley has said. We must not in our every-day practice choose to proceed without pain. It is the guide-post in our work; but when pain becomes too intense, it must be relieved; hence the value of anything of this kind.

It seems to me such a remedy should be confined to the extreme cases, which means not more than occasional use. A good deal of time is lost in making the application, and where that is not justified, it is a serious disadvantage. I say this with the reservation, of course, that time is no object in cases of sufficient severity.

In the little pamphlet supplied with the remedy there is a statement

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to the effect that the vitality of the fibrillæ is destroyed in the carious area, but that the remedy will not affect sound dentin to any *appreciable depth*. If it affects sound dentin at all, where will you draw the line? The amount of the application being small in any case, the variation of 1/100 of a grain may lead to a result very different from what is expected. It makes one a little uneasy to suspect there would be any permanent effect, even if hardly appreciable.

Dr. Buckley states that a "small quantity" of the paste should be sealed in. I should be glad to know more definitely what the proper quantity should be. Is it necessary for us by long experience to learn by the eye just how much—or is there a dosage which will be safe and also efficient?

I think it is always well in a discussion to bring out as many doubtful points as possible, for the sake of giving the essayist a chance to clear them up. If the prolonged dentinal anesthesia produced by Dr. Buckley's remedy will not endanger the life of the pulp, he has undoubtedly made another important contribution to dental science. I am sure we are unanimous in thanking Dr. Buckley for what he has presented.

President Stevenson. I will ask Fr. Fraser, who has had experience in having the paste used in his own mouth, to tell us what he thinks about it.

Dr. Fraser. The preparation of a cavity was begun in one of my teeth, which was very sensitive. It was a compound cavity in an upper molar. Dr. Hyatt had some of this paste, and thought it a good case in which to try it. It was sealed in the cavity for about forty-eight hours. At the end of this time the cavity preparation was completed without any pain to me. I find great pleasure in expressing to Dr. Buckley my sincere thanks for what he has done for humanity.

Dr. Rogers. About three weeks ago I was given some of this desensitizing paste, and I have been experimenting with it in all kinds of cases—cervical and buccal. There seems to be no pain, and it appears as though the tooth were dead. In the case of a little girl, the mother said there had been pain for a few hours, but it passed away, and I cut out the cavity, which had been very, very sensitive, without any pain.

We have had so many things presented to us, that it hardly seems possible—it seems like a miracle—that this should be the case. I have tested several of my cases a week after and found the teeth vital. It is a short time, I know, but we take this from whence it comes, and feel sure

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it will be all right. There is nothing we have been looking for that we appreciate more than this paste from Dr. Buckley, and I am personally grateful to him.

Dr. Voelker. It is always a pleasure to pay tribute to a man who discovers a good thing and helps humanity. Within the last decade, three things have come to us, which have been of immense value—first, the gold inlay; second, the improved silicate cements, and the third, Dr. Buckley's splendid paste. I trust the men here will not forget, in speaking of this particular material, and in using it, always to associate the name of Buckley with it.

I am sorry the paper was not discussed more from its chemical side, because there are several things in it intensely interesting. For instance, it seemed strange to see the word trioxmethylin, which is a purely technical term; I hardly recognized it until I looked it up and found it was my old friend, formalin, under its technical name.

Now, Dr. Buckley, you have the neothesin, which is a white crystallin substance, the trioxmethylin, which is another colorless substance, and the thymol, which is a white substance; then you mix it with a vehicle of petroleum, which is colorless, and than you spoil it with another ingredient—analin—making it useless for me in anterior cases.

Dr. Buckley. Are you afraid of discoloring the tooth?

Dr. Voelker. Yes; that is the only thing which I can find against it in my opinion. I may say that in its use I, too, have had one hundred per cent. of successful results.

The first patient on whom I tried it—Miss W.—came to me, a new patient, very nervous and with quite a lot of work to do. The left lower molar, occlusal surface, had a cavity, and as soon as the explorer went down, the patient jumped about a foot. I tested two or three cavities which were also sensitive, and I thought this would be a good case in which to try the paste. I did so, and dismissed the patient. When she returned, I was a little doubtful, from my experience with formalin, as to what result I would get when I tested the tooth, and I went a little farther than was necessary, and found the pulp decidedly alive. I prepared both of these sensitive cavities without pain.

The next case was Mr. L., who had an exceedingly sensitive cavity, which I could not touch with an explorer, and I put in some of the paste. It was quite a deep cavity. I had some other work to do for him, and we did not get to it until two weeks after, when I could work with perfect ease.

The next case was Miss L. I removed a gold cap which had decay

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under it, and sealed the paste in the cavity for two days, and the patient, as well as myself, was most enthusiastic at the results.

It is not possible for me to put in words the wonderful appreciation I feel for this valuable remedy.

Dr. Gelson. I received from Dr. Hyatt a sample of the paste. I used it in forty-six cases. The only trouble I had was in two cases. In one, there were three cavities. The patient reported a severe toothache in the right lower third molar. I removed the paste, and immediately upon removal the patient had relief. I had treated it in the morning, and she came in again at night—after about twelve hours.

In the other case I removed the paste and then could proceed.

In the other cases success was complete.

Dr. Ottolengui. In one part of Dr. Buckley's paper he said he felt almost as if he were undertaking something that was impossible. When he gave me his paste, and told me what results he thought could be obtained, it seemed to me also that he was attempting the impossible.

In the first case in which I used it, the result was so complete a desensitization of the cavity that I could hardly believe I had not devitalized the pulp; and, as Dr. Voelker said, I went on until I found I had plenty of sensation in the cavity!

I then made an experiment such as Dr. Buckley himself reported. I had a case in which it seemed to me a question whether I should or should not remove the pulp—a case in which I did not care whether I killed the pulp or not. I used the paste and found the cavity absolutely desensitized, so that I could remove all of the carious portion, and I finally uncovered the pulp, which was alive, and then with pressure anesthesia I removed it.

I have a more important report than that, however, to make to you. We have just had to-day what might almost be called a final test. A great many propositions have been given to the profession about desensitizing teeth. We have had this problem solved almost annually since I have been in the profession. We have had an overenthusiasm—and the greatest success has been obtained in cases where it was the least needed. I have long ago become so skeptical of all these agents that I had schooled myself to use methods to minimize pain as much as possible without any such agents. I have, however, been using chloride of ethyl for the last five years, but only in extreme cases. Since I have had Dr. Buckley's paste I do not recall a single instance of failure, except one, which I think was explainable on ac-

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count of faulty sealing in the cavity. Even in that case the tooth was prepared with less pain than it would have been otherwise.

In the early part of last week a patient presented with this interesting introduction. I had received a letter announcing her coming and making an appointment. When she came to me she said: "Have you heard about me from Dr. Keefe?" I said, "No." "Well," she said, "I am Dr. Keefe's worst patient." I put her in the chair and found an awful condition: a splendid young woman of about nineteen, with a decalcification along the gum line of all teeth from right second molar to left second molar. This patient was most hypersensitive. I found it almost impossible in trying to make an examination to even dry out the parts, and I was surprised to find four fillings in her mouth. I asked her how that was done. She said Dr. Keefe turned her over to Dr. Buckley in Chicago. She said: "He uses a wonderful method that works with everyone except me. They thought they could use analgesia, but they were obliged to use anesthesia." She told me they had to "put her to sleep" to fill those teeth, and even then she felt it. She said: "Now they tell me *you* can do it; and I want to know if you can." I said, "I have a paste here that Dr. Buckley has gotten out especially for people like you." She said, "Well, I hope it will work, but I doubt it."

If any of you gentlemen have heard the exponents of analgesia describe it technique, you recall that they tell you they use a combination of oxygen and nitrous oxide; but in the last analysis they admit that they rely on "natural gas" to a large extent. (Laughter.)

In my opinion, that is one of the most valuable ingredients. I used all I had in the office on this young lady. I sent her away with what an eminent alienist has called "pleasurable expectations."

I found practically no large cavities, but on the buccal surface of the second molar I found a very shallow cavity, and I selected that for for this experiment. I smeared in the paste and covered it with calxine. When she came back I removed this calxine and started to prepare this cavity, and she went right up in the air. Then she said: "There is another beautiful dream gone wrong. Now what shall I do? Dr. Buckley's paste is just as bad as that analgesia."

I believe that paste had some effect, but I do not thing my "natural gas" had yet begun to affect her. She had not reached the point where she was willing to let me operate.

Now, what is pain? We say this "hurts," or that "hurts." Pain is only measurable by the person who feels it, and no matter how little the potentiality of the pain is, if the patient is so sensitive that the least touch will make her suffer, she is suffering pain, and there must be something done to relieve it. This was therefore an especially fine case in which

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to test this paste. I thought I might have interfered with my results, because I had not used cotton, and that the calxine had perhaps picked up the paste.

I had not heard this paper then, and I said to her: "I believe we have not succeeded in confining the paste in the tooth. I used a certain cement, because it would be easy to remove, but it has proven too easy; now I am going to use something which will remain until next week. Dr. Buckley will be here then and we will see what he thinks." I applied the paste on a little pledget of cotton, and then put over it Ames's stickiest oxyphosphate, flowing it over onto the enamel. You can imagine what a pleasure it was to me to find the oxyphosphate still adherent to that tooth to-day, and that we had thoroughly sealed in the paste.

Dr. Buckley was present when she called to-day, and he said: "You will be able to cut that tooth." I had said to myself that I would not consider this paste a success unless it worked in this particular case. I took out the dressing and put in a little bibulous paper to dry it, and she said: "I don't believe that hurt very much." I took one of my sharpest excavators and I very gently started to do a little cutting. She said: "I don't believe that hurts very much, but I don't think I can let you go much further." I scraped out the decalcified dentine and then I took up a stone, but she balked as soon as she saw the engine. I said: "I am only going to use this to smooth the edges. Anyhow, these stones do not hurt. They only make a noise." I went around the edges and she did not move, and I prepared the cavity for a porcelain inlay.

I believe this paste is everything that Dr. Buckley claims for it. I do not think you could have a more difficult case than I have described to you, and I think I will be able to fill all this girl's teeth, though perhaps not always with only one application.

We have been told here to-night that this paste will not destroy a pulp. I prophesy that in the future even good men will report that they have destroyed pulps, but in my opinion they will be wrong. You can consult the literature and you wll find men who have said there must be arsenic in oxyphosphate because pulps have died under oxyphosphates; but the fact is, if the operators had been competent pathologists they would have removed the pulps before filling the teeth in the first place. Pulps will die which should have been taken out before this paste was put it. I shall ask any man who comes forward and says he has destroyed a pulp with Buckley's paste to read what I am saying now, and I shall then ask him if he does not think the pulp would have died and become septic if he had prepared the cavity without this paste.

The same is true when you put in large inlays. You will prepare some of those cavities painlessly, perhaps deeper than you should, and

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put in a larger inlay than you should, too near the pulp, and you will blame Buckley for it, when you ought to blame yourself.

Dr. Buckley. The hour is late, and only a few points have been raised in the discussion to which it is necessary to reply; therefore I shall be brief.

I appreciate deeply the kind words that have been spoken. I do not blame anyone for being skeptical and suspicious. I would expect conscientious men, like Dr. Dunning, who had not used the paste, to be skeptical. They are the men who are the most enthuiastic after they use the remedy and learn its worth. I want to say to you that many a time I have pinched myself to see if I were really awake. I did not believe at first that the results I was getting were possible; they seemed too good to be true. That was the reason why I selected these men in whom I had confidence, wrote them letters and sent them the remedy and asked them to try it and see if it would do for them what it had done for me. I wanted to be certain of my ground before I gave the formula to the profession.

Dr. Tracy and Dr. Voelker have used the word "formalin" in speaking of the constituents of the remedy. This word "formalin" is generally used to designate a 40 per cent. solution of formaldehyd in water. Desensitizing paste contains trioxymethylen—tri, meaning three—and oxymethylin, formaldehyd, and there are three molecules of formaldehyd (CH_2O) in one of trioxymethelen $(CH_2)_3$, or, in other words, it is polymerized formaldehyd, a solid, not a gas. This as a solid form of formaldehyd, and is slowly decomposed into the gaseous formaldehyd by the heat of the body.

Dr. Voelker also says that he would prefer to have the paste without the coloring agent, for fear this might stain the tooth structure. It would have saved me a great deal of experimenting had I felt that everyone would have been of the same opinion. It was difficult to get a satisfactory color. I wish you might see the array of colors I used, ranging from red and pink to blue, green, yellow and gray. Dr. Ottolengui will remember that his first specimen was pink. Dr. Goslee's was yellow. I could not have this preparation of a pink color, for the reason that my devitalizing fibre happens to be pink. It would not do to have both of these preparations of the same color. The color which I finally adopted is a grayish-green, and it is absolutely insoluble. It is impossible for one to stain a tooth with the coloring agent in Desensitizing Paste, just as it is absolutely impossible to stain a tooth with the coloring in my devitalizing fibre; while the latter is pink, it is insoluble in the fluids of the tooth. Now, why is it desirable to have these preparations colored? Simply that one can readily see the remedy when it is

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applied to a tooth. The color of the dentin is a light yellow, and the cement generally used for sealing is also white or yellow. When you apply these colored preparations to the cavity you can see them. If they were a whitish-yellow, as the gentleman seems to prefer, the average man, being in a hurry, could not see if he had it properly spread over the cavity surface and hermetically sealed it in.

Dr. Ottolengui. What you sent me first had fibre in it, but I do not see any in the later preparation.

Dr. Buckley. It is in there, nevertheless, but not in so great proportion as in some of my first formulas. I am not going to detain you longer. When my paper is published I hope you will study it carefully, and I know if you use Desensitizing Paste as suggested therein you will be as enthusiastic as others who have used the remedy, and your patients will be equally happy. I thank you.

Do you realize what it means? It means we can do better work and do it with more ease to our patients and ourselves. Our patients will no longer come to us with that intuitive dread of the dental chair that has always existed. We can conserve the vitality of our patients and of ourselves, and I believe that five years at least will be added to the active lifetime of every practicing dentist. I think I can safely prophesy this, and I believe the future will bear me out. It means also the passing of this present wave of enthusiasm which is sweeping over the country with regard to analgesia. We no longer need to give to our patients an anesthetic which will produce either partial or complete anesthesia, but can follow a saner line of procedure and one which is far safer in all cases. In conclusion, when the history of the dental profession shall have been written, I firmly believe that the name of Buckley will stand out conspicuously and prominently, and will properly be placed alongside of and with such names as Sir John Lister, Koch and Pasteur, and our own beloved Horace Wells, as benefactors of the human race.

Forty-Fourth Annual Meeting of the New Jersey State Dental Society.

The forty-fourth annual meeting of the New Jersey State Dental Society convened at Ocean Grove, N. J., on Wednesday morning, July 15, 1914. The assembly having been called to order by the President, Dr. William H. Gelston, the proceedings were opened with prayer by Rev. J. D. Bills.

This was followed by a call of the roll, after which Dr. A. E. Ballard delivered an address of welcome which entertained and was much appre-

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ciated by the members present. The minutes of the previous annual meeting were then read and accepted and approved as printed in the record. Thereupon the vice-president, Dr. Walter F. Barry, assumed the chair, and Dr. William A. Gelston read the annual presidential address.

Chairman Barry. You have heard the reading of the President's address. What is your pleasure?

Dr. Arthur R. Slade. I move that a committee of five be appointed for the consideration and a report on the president's recommendations.

Dr. Fowler. I presume the president has not overlooked the fact that in order that we may take any action on this proposition concerning changes in the Constitution and By-laws it is necessary to inform the secretary at Trenton bearing on this recommendation. I would simply like to ask the president whether he has written to the secretary informing him of these resolutions embodying these proposed changes?

President Gelston. All that needed action regarding a changing of the constitution embodied in these recommendations were sent to the secretary more than ten days prior to this meeting, which according to the act or the amendment of the act, is required. Motion seconded and carried.

Chairman Barry. I will appoint the following committee to consider and report on the President's address, after which I will surrender the chair to the President.

Arthur R. Slade, chairman; Henry Fowler, C. P. Tuttle, E. W. Harlan, R. S. Hopkins.

President Gelston. (Taking the chair). Under Miscellaneous society business I will appoint the following committee to report appropriate resolutions on the death of Dr. Charles A. Meeker, ex-president and ex-secretary of our society.

G. M. Holden, chairman; Frank L. Hindle, Harvey Iredell, C. W. F. Holbrook, Joseph S. Vinson.

Dr. Fowler. It is with a great deal of regret that we have heard of the illness of one of our prominent members from Atlantic City, who is unable to be with us at this convention. I think it would be fitting, at this time, that the society send a telegram of sympathy to him and his family, expressing our regret at his illness. I refer to Dr. Joseph F. Crandell, of Atlantic City. I would also include that the same apply to Dr. Robert Wakefield, of Cranford. I therefore move that the society send to them a telegram of sympathy in their illness. Motion seconded and carried.

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Secretary Forsyth. Your secretary has some resignations that the society will be required to act upon. I have received the following resignations: James S. Miller, Abraham Kuntz, John R. Westervelt, Theodore K. Hayward, Herman Fordyce, Leroy Farley, William B. Ley, L. W. Delaney, V. E. Mitchell.

Dr. Harlan. Moved, that if those members are in good standing that the resignations be accepted. Motion seconded and carried. On motion, adjourned until 8 P. M.

Wednesday, July 15, 1914, Evening Meeting.

President Gelston. First, we will have a report from the Senior Delegate to the House of Delegates of the National Dental Association. Is Dr. Charles S. Hardy present? (Dr. Hardy was not in the room.) As Dr. Hardy is absent I will call upon the Junior Member, Dr. Henry Fowler, for the report.

Dr. Henry Fowler. Mr. President, before making this report I wish to say that no doubt it should come from the Senior Delegate, but in view of the fact that he is not here I will make a short report.

Report of Delegate to the National Dental Association Meeting. Rochester, New York, 1914.

First of all, the magnitude of the work involved in bringing about such a meeting must be understood to fully appreciate the labors of the men who successfully brought the Eighteenth National Dental Convention to an end July 10, 1914.

The society was indeed fortunate in the selection of Rochester for the 1914 meeting, having as it does an ideal arrangement in the buildings and grounds of the Municipally owned Exposition Park, and an administration headed by its mayor, which is anxious to co-operate and to welcome all organizations coming to their city. The civic pride of its residents in boosting and maintaining a friendly attitude towards visitors, is Rochester's proudest asset.

While all officers and committees responsible for the 1914 meeting are deserving of the highest commendation for their untiring efforts, yet, to fail to make special mention of the work of the Rochester Local Committee of Arrangements, headed by Dr. Edward G. Link, would leave out the most frequent expression heard on the grounds and in the hotel lobbies. Dr. Edward G. Link and his co-workers have made history in the successful management of a big convention.

Briefly, there were at the service of the National Dental Association two main lecture halls, four smaller, one for moving pictures and lantern lectures, two clinic rooms larger than required and exhibit space far in

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excess of that needed. In addition to the above there was a restaurant on the *"à la carte"* plan, almost in the center of the group of buildings forming the Exposition Park, which gave good service at moderate prices.

As the official program of the meeting has probably reached most of the men present it will be unnecessary to speak of it other than to say that the essays, discussions, and clinics, as well as the exhibits were of the highest order. In passing it may be of interest to note that the progressive clinic was again demonstrated as being the best way to handle this difficult problem.

The arrangement of the main offices for registration on entering the grounds, divided into separate sections for groups of States with a registration officer in charge of each, proved highly satisfactory and efficient; the total registration was not definitely announced but was estimated to be in the neighborhood of 2,000.

The plan of reorganization of the National Dental Association has been successful beyond anticipation, and President Homer I. Brown announced that the association now has a membership of more than 12,500 and that within the year the number will probably be increased to almost 20,000 by the enrollment of several State organizations that are in process of adjustment for this purpose. A reference to the official program will give details as to the States now in the Association and their delegates.

The House of Delegates, consisting approximately of 100 members from the various State organizations, convened promptly at 11 A. M. Monday, July 6th, and proceeded to Roll Call and organization. Dr. Arthur D. Black, of the Amendment Committee, presented a number of amendments to the constitution and by-laws, which were referred to various committees. Dr. H. J. Burkhart, of Batavia, N. Y., brought to the attention of the delegates the discrimination against American dentists practicing in the British possessions with reference to membership in the International Dental Congress to be held in London in August

Dr. B. Holly Smith introduced a resolution, which was adopted, authorizing President Brown to forward a protest to the British Management of the International Dental Congress. At a subsequent session of the House of Delegates ways and means were provided whereby the delegates from the U. S. A. could take care of all reputable American dentists practicing abroad in the matter of membership to the International Dental Congress.

Meetings in all departments were held promptly on time and went at once to the work in hand, thus greatly expediting the program.

A number of amendments to the constitution and by-laws were passed, but as they were mostly for the purpose of clearing up uncertain

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and ambiguous phrasing the general import was not changed to any extent from the original as adopted last year. Provision for the equitable selection of the Board of Trustees was made by the formation of nine districts to have one member each, consisting of a grouping of the States and territorial possessions according to their respective membership in the National Dental Association. All state societies are to be represented in their respective groups by delegates who are empowered to nominate a trustee from their respective district to be elected by the House of Delegates as the trustee from said district as follows:

District No. 1.

Maine	1	
New Hampshire	1	
Vermont	1	1,063 Members.
Massachusetts	3	
Rhode Island	2	Dr. W. E. Boardman.
Connecticut	3	
	11	

District No. 2.

New York	9	1,421 Members.
New Jersey	2	Dr. H. J. Burkhardt.
	11	

District No. 3.

Pennsylvania	3	
Maryland	1	1,699 Members.
West Virginia	1	
Ohio	8	Dr. C. J. Grieves.
	13	

District No. 4.

Virginia	2	
District of Columbia	1	
Capital	1	
U. S. Army Corps	1	
South Carolina	2	849 Members.
Georgia	1	
Florida	1	
Mississippi	2	
Alabama	2	Dr. J. P. Hinman.
Louisiana	2	
Porto Rico	1	
	16	

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District No. 5.

Michigan	4	
Indiana	4	1,700 Members.
Kentucky	3	Dr. M. L. Ward.
Tennessee	2	
	13	

District No. 6.

Wisconsin	1	1,759 Members.
Illinois	10	Dr. J. P. Buckley.
	11	

District No. 7.

Iowa	4	
Minnesota	3	
Nebraska	3	1,413 Members.
South Dakota	—	
North Dakota	2	Dr. T. B. Hartzell.
Wyoming	1	
Montana	1	
	14	

District No. 8.

Missouri	4	
Kansas	3	
Colorado	2	1,471 Members.
Arkansas	1	
Oklahoma	2	Dr. C. L. White.
Texas	2	
Arizona	1	
New Mexico	1	
	16	

District No. 9.

Washington	2	
Oregon	2	
California	4	9,987 Members.
Southern California	2	
Idaho	—	
Nevada	—	Dr. S. W. Wherry.
Utah	1	
Alaska	—	
Hawaii	—	
Philippines	—	
	11	

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The name appearing with each district was duly nominated and elected and together will constitute the Board of Trustees for three years, three for two years, and three for one year; thereafter three new trustees will be selected each year. Those selected will serve as follows:

Three years—Drs. Burkhart, Buckley, Hinman.

Two years—Drs. Grieves, Boardman, Hartzell.

One year—Drs. Ward, Wherry, White.

Following the election of the Board of Trustees, the election of the officers of the National Dental Association took place and resulted as follows:

President—Dr. Don. M. Gallie, Chicago.

First Vice-President—Dr. Ed. G. Link, Rochester.

Second Vice-President—Dr. Dotterer, St. Louis, Mo.

Third Vice-President—Dr. V. E. Turner, Baltimore.

General Secretary—Dr. Otto U. King, Huntington, Ind.

Treasurer—Dr. H. B. McFadden, Philadelphia.

For the office of president the successful candidate had as his opponent Dr. Chas. C. Allen, of Kansas City, and for treasurer Dr. J. V. Conzett, of Dubuque, was the losing aspirant. All other places were filled without a second nomination. The chairmen of various committees were, as a rule, prompt and thorough in making their reports.

Special attention is called to the work of the Scientific Foundation and Research Commission, of which Dr. Weston A. Price, of Cleveland, is chairman, and whose report will appear in due time in the published proceedings of the Association.

While many in our State have appreciated the necessity and importance of the reorganization of the National Dental Association, which has made it possible for President Brown to announce a membership of 12,500 instead of the scant 1,000 of a few years ago, yet our own State Dental Society has not become a member of the National Dental Association. I strongly urge that means be taken to bring this about at the earliest possible moment in order that our State may have its full quota of representation and standing in said organization.

(Signed) HENRY FOWLER.

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Dental Education of the Public Through the Newspapers.

We constantly prate about the "education of the public" in regard to dental progress. When tired of talking on this topic we utter smug dissertations upon the ethical breach committed by the man who submits to a newspaper interview. What is the logical result? With one argument we prove that the press should be utilized for educating the public, while with the other we alarm those men best qualified to write such articles as would advise the layman of the real progress made by dental scientists. Finally, having created a demand while limiting the supply, the public receives its dental education from men poorly equipped as dental teachers, or at times from dentists who desire to advertise themselves rather than to advertise dentistry.

Two of three years ago the writer induced the editor of the *New York American* to publish four articles, each a page in length, dealing with the latest achievements in dentistry. These popular articles were written by a staff reporter from sources of information pointed out by the present writer, and the reporter adhered to his agreement to omit names of individuals. But the alert newspaper man does not want that sort of "story." He wishes to publish articles written by men who are recognized as authorities; and in support of statements the modern editor demands the signature of the writer. As the authorities in dentistry are forbidden to write for the newspapers, we cannot blame the newspaper man if he obtain his dental article from some other source.

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The Supplement of the Sunday edition of the *New York American* is also issued with the Hearst papers in Boston, Chicago and San Francisco, while many of the articles are "syndicated" to Sunday newspapers in other large cities.

The following highly educational article appeared in the *New York American* Supplement on Sunday, November 8th, and together with its widespread publication in other newspapers probably was available for reading matter for about four million individuals. As it was signed by Leonard Keene Hirshberg, A.M., M.A., M.D. (Johns Hopkins), it has probably been accepted as a true bill against dentists:

Dentistry According to Hirshberg.

"Thirty years ago, before the discoveries of Pasteur, Koch and Lister that decay, fermentation, ulceration, abscesses, diseases, sores, blood poisoning, boils, erysipelas and decomposition are all caused by tiny, little living microscopic plants and animalculae, it was the custom to have one's teeth pulled out at almost the slightest sign of the black spot of decay.

"To-day, a generation later, teeth are still pulled out joyfully by many dentists. True enough, a few teeth are nowadays conservatively filled. But, for the most part, the merry murder of your feelings and the racking of your jaw bones still goes blithely onwards. Even the use of local anesthetics assuages not the after sensation of an aching void and a yawning chasm in the gums.

"Medical methods have progressed—organs are transplanted, even bones are sewed together as neatly as a woman's skirt; yet the science of dentistry has moved as slowly as a tortoise. The thirty years which have passed since the discovery of bacteria as the cause of decay have left little impression upon it. Not only are there comparatively few dentists who are personally aseptic themselves or who sterilize their instruments, but, like barbers, they practice the same errors now which thy perpetrated in the seventies.

"Dr. Wren H. Oliver, of London, and his colleague, Dr. H. A. Barker, protest in an emphatic manner against the all too-prevalent practice of pulling teeth and replacing them with false ones. They say that among some of the older dentists and a large portion of the public there appears to be an impression that nothing can be done either to prevent diseases of the teeth or to cure them when they have been once incurred

"As a result of over thirty years' experience it is their opinion that it is no less criminal to extract a tooth because it is in an ulcerated or broken-down condition than it would be to remove an eye to get rid of a cataract. Yet you are continually hearing of poor unfortunates who have submitted to the extraction of all their teeth to be cured of gum disease.

"Dr. Oliver has been protesting for years against the malpractice of quack dentists, and has viewed with horror the wrecked mouths of the poor deluded people who have been induced to part with all their teeth to make way for wretched substitutes. It is deplorable, he says, that nothing can be done to suppress these pests of society.

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"There can be no doubt, says Dr. Barker, that the wholesale extraction of teeth has become almost a craze.

"Not long ago a lieutenant of the Royal Navy Reserve went to him in despair about a lameness of his knees, which had refused to yield to treatment at the hands of several distinguished surgeons. At last the surgeons supposed the real cause had been found in inflammation of the lining of the teeth. Several teeth, sound and unsound, were accordingly taken out. But the knee, instead of getting better, grew worse.

"On careful examination Dr. Barker found that the patient had a badly dislocated cartilage. He had the man anesthetized, replaced the cartilage, and he rapidly recovered. But he is now minus several teeth which he ought never to have lost.

"Dr. Oliver even goes so far as to maintain that with the new knowledge of asepsis, antisepsis disinfection and local as well as the internal use of citrate of soda with hexa-methyl enetetramine—a drug which breaks up into formaldehyde inside the human tissue—it should seldom be necessary to extract teeth from a person whose general health is good.

"This teeth-pulling fetich has become a superstition—a tradition handed down from long before the time of the Pharaohs, says Drs. Barker and Oliver. Dentists, like barbers, never get away from the things told them by their masters. Those masters, as journeymen dentists, receive the errors in perpetuity from their masters in turn.

"The facts that have come to dentists in recent years, like those which are available for barbers, are too often utterly ignored. Teeth are jerked out at the slightest provocation, when, according to these London professors, ninety-nine per cent. of them, if treated the same as a skin ulcer or a boil, could be saved to their possessors."

Printed with the above is a really good diagram showing first, a section through a tooth disclosing a carious cavity, a putrescent pulp, and an apical abscess; and, secondly, the same, with root canal correctly filled, the cavity stopped with an inlay, and the abscess cured, so that the illustration at least furnished a true picture of modern dentistry.

Can We Control Newspaper Dentistry.

It is not the purpose of this editorial to defend the dental profession from the assertions of Dr. Hirshberg, but rather to arraign the dental profession for so conducting its affairs that Dr. Hirshberg would write, and a prominent newspaper editor receive for publication, an article which so grossly misrepresents the facts. It is odd, too, that Dr. Hirshberg should cite two authorities, both Englishmen, probably writing of conditions existing in their own country, and accept these foreigners' views as fairly picturing dental practice in this country. The article is doubly peculiar since at the recent International Dental Congress prominent English dentists sounded a

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word of warning against the "prevalent practice of trying to save all teeth, however diseased," the discussers arguing that in view of the proof offered that many body diseases have their initiation in tooth root infection it is a hazardous procedure to attempt the salvation of diseased teeth unless there be at least more than a reasonable hope of success.

This, however, is aside from the present question. The problem before us is: "How are we to prevent or control the publication of misleading literature in connection with dentistry?" If we cannot permit volunteer efforts in this direction, then is it not the duty of our local State and National societies to appoint men to serve as a press committee? If in each locality we might have a wideawake, virile writer, who might prepare articles for the newspapers and reply to such misleading communications as this of Dr. Hirshberg's, dentistry, dentists and the public at large would quickly benefit. Are we too ethical or too squeemish or too cowardly to do this?"

Correction.

When errors occur in any publication, it is customary for the editor to cast the blame upon the proof-reader, while the proof-reader passes it on to that convenient mythological individual, the printer's devil.

However, certain errors occurred in the November number of ITEMS OF INTEREST in connection with which the editor feels that at least he should divide the responsibility with the aforesaid devil. In Dr. Kirk's discussion of the paper by Dr. Corwin there are several typographical errors, which our readers have undoubtedly detected, and for which we beg to be forgiven; but the principal mistake is the use of the word "katol," which should have been written "skatol," and we particularly call attention to this, with regret, because it may seem to some to be a chemical error on the part of Dr. Kirk, instead of an error in proof-reading. It is only fair to Dr. Kirk to say that neither copy of his discussion nor proof was submitted to him, as at the time he was in Europe.

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National Dental Relief Fund.

Office 63 Trumbull St.

To the Members of the National Dental Association:

The favorable response which you made last year in the introduction of a Christmas Seal, as a means to increase our Relief Fund, was most gratifying to your committee. Realizing as we did that we were in a degree following the course of another organization, yet we felt assured, inasmuch as we were working for the same purpose, the relief of our suffering brothers, we should be, as we were, sustained by your liberal endorsement and contributions in excess of the number of Seals sent you. We were handicapped last year, first by delay in having our designs satisfactorily printed, then by stoppage by the Postmaster General and much clerical expense, so that we were unable to get the Seals into the hands of our members until about the first of December. However, with all these disadvantages, we brought our fund up to $9,620. Profiting by experience, this year our expense will be nil, and the Seals can now be had at the Dental Supply Houses or from this office.

The necessity for a Relief Fund is made more manifest by repeated appeals to your committee by members who are suffering for the necessities of life. Surely we should this year by our large increase in numbers, easily increase this fund by purchase of Seals, and annual contributions which we are about to solicit, up to a sum not less than thirty thousand dollars. Then from accrued interest we could begin to respond to these calls from our unfortunate, and it is no exaggeration when we say suffering members. Brothers, a little from each will accomplish this much-desired ideal. Will you do it?

In sending your order to this office, make all checks payable to National Dental Relief Fund, as your check becomes a receipt, saving expense in acknowledgment.

Fraternally yours,

L. G. Noel, W. T. Chambers, James McManus.

E. S. Gaylord, Chairman.

National Dental Relief Fund Committee.

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IT IS WORTHY OF NOTE that the S.D.D.S. has held two monthly meetings thus far, and that in each case the attendance was from thirty to fifty in excess of the actual membership, which is not a bad record. By the way, I should explain that S.D.D.S. does not stand for "Some D.D.Ses," but means "Second District Dental Society," "of New York" being understood. Note that "S.D.D.S." reads backward and forward the same, which implies that harmony is the actuating impulse among the members and that whoever at the moment may be the officers, they enjoy the unqualified support of the others. This is as it should be if a society intends to accomplish anything.

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IT WAS AFTER THE November meeting, and a few genial and congenial spirits gathered in one of the cosy corners of the Crescent Athletic Club. The other fellows ordered Scotch whiskey, French vermuth, Russian vodka and Munich beer, but, being neutral myself, I had only a glass of Saratoga Springs water. As you will be interested more in what was said, rather than in who said it, I will omit real names, and identify the members of this dental conference by the nationality of the drinks they drank.

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THE TOPIC FOR discussion at the Society's meeting had been the pathology of the dental pulp and treatment of root canals in general. At the club conference the Scotch person started the talk with this riddle: "Why is a talk Around the Table, like this, similar to a blind abscess? No! Don't try to guess, because in the first place you can't, and secondly, if you do, you deprive me of the pleasure of telling you. Answer: Because just as the germs of disease from a blind abscess may infect the entire physical body, so the germs of truth uttered here to-night by such brilliant thinkers as ourselves, when accurately reported and printed in the journal of our Spring-water drinking friend, may affect the entire professional body of dental workers. Do you see?"

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"I SEE PERFECTLY," said our French friend, "but when you use the expression 'brilliant thinkers,' why so immodest as to include yourself? No! Don't apologize. We know it was thoughtlessness, which shows you are no brilliant thinker. But let us see what sort of an observer you are, or, better still, let us apply the test to all of us. We attended a meeting to-night and heard a lot of talk on a pretty old subject. Did we hear anything especially new, important or worthy of wide publication? Let each recall, if he can, one or more points that may have impressed him, and we all can talk it over."

"THE SUBJECT," said the German, "was old, of course, but considering what we are learning nowadays from men like Grieves, Hartzel and others, there is scarcely any topic in dentistry more important than root-end disease. Therefore, any practical points that we can get out of a meeting like that of to-night cannot be too widely disseminated. For my part, I think the essayist gave us a splendid and timely paper, and that there were a number of good suggestions, which even though not entirely novel, were rather better put than I ever heard before."

"TALK LESS AND SAY MORE," interjected the Russian. "What in your opinion was the most useful advice given by the essayist?"

"WELL, I PARTICULARLY approved of his recommendations and specimens showing how to enter root canals," replied the German. "You recall that he declares that sooner than leave the root canal improperly cleansed and filled, he would sacrifice the entire crown in order to gain suitable access to the entrances thereto. At the same time he pointed out that the more natural tooth tissue one could preserve without militating against the thoroughness of the root canal work the better for the patient. He advised that the cavity proper should, if possible, always be prepared in such a way that the axial walls should directly approach and be continuous with the walls of the root canal. Another very important point was his very forcible argument against using burs or other cutting instruments upon the floor of the cavity, since if left in its natural condition there always is a funnel-shaped depression leading directly into the canal orifice. Personally I was as pleased as I was surprised by his exhibit of specimens showing cavities prepared so that perfect access to the canals was obtained, yet the cavities themselves were extremely small. Much smaller, in fact, than I make them myself."

"I AGREE WITH ALL that you have said," commented the Frenchman, "but you must remember that in this, as with many other clinics out of the mouth it was much easier to get access to all those canals, holding the tooth in your hands and twisting it as you please for admitting light and operating your instruments than it would be in actual practice in the mouth. Nevertheless, it was a good point to bring out, especially for the benefit of the younger men, because by showing them the minimum cavity through which it is possible to accomplish thorough root work it should render them less hasty in making radical extensions of cavities

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merely for personal convenience. The patient is entitled to retain as much as possible of that part of his tooth which is non-carious."

"THAT WORD, NON-CARIOUS," said the Scotchman, "brings us to another phase of this question. All those specimens shown to-night were prepared in non-carious teeth. Working on sound teeth it is quite easy to cut ideal cavities, with walls leading directly into the canal orifices, and with a floor having funnel-shaped depressions indicating just where the orifices are. But, unfortunately, the major part of the demand for root work occurs in carious teeth, and often the caries has already obliterated these funnel-shaped land-marks on the cavity floor. Again, in older teeth, where secondary dentine has accumulated, the cavity orifices are not only very obscure, but often so attenuated that they are hard to find at all."

"THAT REMINDS ME," said the Neutral, "of a rather good suggestion made in my hearing lately by Dr. Hyatt. He said that in such cases he swabs the floor of the cavity with a pledget of cotton saturated with iodine. Next, with clean cotton he wipes the iodine away. But usually the iodine penetrates the orifice of the canal so that after the cavity floor has been wiped clean, each canal opening shows up as a dark dot, and a fine bristle then easily enters the canal proper."

"THAT SOUNDS LIKE a good trick," said the Russian, "and I shall certainly try it, and, by the way, Prof. Starr in the discussion to-night described another little method that sounded good to me. I have noticed that a great many essayists point out that medicaments sealed into a canal should really be sealed in if we are to get full benefit from them; and they then declare that gutta percha does not sufficiently well seal up the cavity. But Dr. Starr to-night, I think, proposed a good scheme when he recommended filling the cavity with gutta percha, then chilling the gutta percha and removing it, and then dipping the cavo-surface in eucalyptus and replacing it, the eucalyptus softening the gutta percha sufficiently so that it adheres to the cavity walls, thus making a perfect seal."

"THAT IS ALL very well," said the Frenchman, "when the cavity is so shaped that the gutta percha can be easily withdrawn. But often there are undercuts, and you could not remove the gutta percha after chilling it."

"YOU OUGHT TO BE demoted to the infant class," said the German. "The withdrawal and replacing of the gutta percha is not the important factor; it is the use of eucalyptus to cause the gutta percha to adhere to the cavity walls that really improves the sealing quality of the filling. In a case where the filling cannot be withdrawn whole, I would think that the results could be attained by wiping the walls of the cavity with eucalyptus before introducing the gutta percha."

"DID YOU HEAR someone ask the essayist," said the Russian, "what sort of air he used for drying out his canals? then when the essayist replied,

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❖ 'Just ordinary, everyday air,' the same man asked, 'How do you sterilize ❖ it?' I thought that was rather good myself. .So much had been said ❖ about making the operation aseptic that one would hardly think it cor- ❖ rect practice to inject 'ordinary, everyday air' into the canal, because ❖ 'ordinary, everyday air' usually contains 'ordinary, everyday bacteria.'"

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"OH! FUSS AND FEATHERS!" exclaimed the Frenchman. "If ordinary, ❖ everyday air is good enough to be breathed into our lungs, it ought to ❖ be good enough to blow into a canal of a tooth. Besides, I think the ❖ essayist made a very good reply when he said that he used the air to ❖ dry out the canal at the moment after flooding it with alcohol, and that ❖ only enough air is used to accomplish this purpose. Thus, even if bac- ❖ teria should enter the canal with the air, they would enter a sterile field ❖ in which they could not propagate, especially as a moment later the ❖ canal would again be closed with an antiseptic root filling, antiseptically ❖ introduced."

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"THAT, OF COURSE, IS TRUE," said the Scotchman, "but why take a ❖ chance? What is the harm in sterilizing the air? Did you ever see a ❖ bacteriologist make a culture? Before dipping his platinum loop into ❖ the bacterial mass he passes his platinum loop through the Bunsen ❖ flame, thus destroying positively any bacteria that may be on the loop. ❖ In similar way I use an ordinary chip blower for drying out a canal, ❖ but I squeeze the rubber bulb together and then place the nozzle of the ❖ syringe in my Bunsen flame and allow the bulb to expand slowly. The ❖ air is thus heated and sterilized at the same time. In doing this, of ❖ course, only one blast should be used in the canal before returning the ❖ nozzle to the flame. This may not be necessary, but surely it can do ❖ no harm."

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"I WAS PARTICULARLY impressed," said the Neutral, "with the discus- ❖ sion of Dr. Van Woert. He pointed out that the mouth is usually ❖ pregnant with bacteria of many sorts, and that in using the rubber dam ❖ and rubber dam clamp, as ordinarily applied, without aseptic precautions, ❖ it is not impossible that the patient might be infected, the clamp breaking ❖ the soft tissues, and the bacteria finding entrance in this manner. At ❖ all events, I like his technique."

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"WHAT WAS HIS TECHNIQUE?" asked the Frenchman. "I missed that. ❖ I was talking to my neighbor."

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"I HAVE NOTICED," said the Neutral, "that when others are discussing ❖ a paper you usually are talking to your neighbor. And let me tell you ❖ something. When your mouth is open your hearing usually is impaired. ❖ Because when sound is coming out of the mouth, sound cannot enter ❖ the ears."

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"QUITE SO," retorted the Frenchman. "Now let me tell you something. ❖ I have noticed that when your mouth is open sound may come out of it, ❖ but very little sense."

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"QUIT QUARRELING, CHILDREN," interposed the Russian. "Let our sober spring water friend tell us Van Woert's patent process for preventing infection when applying the rubber dam."

"OH! I WOULD NOT GO SO FAR as to claim that it prevents infection," said the Neutral, entirely ignoring the Frenchman and his gibe. "Nor do I think Van Woert would. But we call ourselves dental surgeons, and it is our duty to take all the precautions against bacterial infection of the patient usually practiced by a surgeon, or which would be practiced by a real surgeon operating in our field. I understood Van Woert to say that before applying the dam he cleanses the parts about the necks of the teeth with surgical soap (an antiseptic soap) and then paints the gums with iodine. Then he uses a five per cent. carbolized vaseline for lubricating the holes in the dam itself. This certainly seems rational."

"YES, IT IS RATIONAL ENOUGH," said the Scotchman, "and I am sure I would like to feel that when I perform a root canal operation I could be assured that the whole procedure could be aseptically conducted. Yet I must confess that infection may enter through so small a gateway that I cannot but feel that it is a discouraging undertaking."

"WE ALL MUST FEEL that way at times," said the Neutral, "and for that very reason we should omit no precaution, however unimportant it may seem. I doubt very much that we can always be assured of an absolutely sterile field and a perfectly aseptic operation when dealing with root canals, but of late I have adopted a method which at least eases my mind somewhat. Aside from boiling instruments in the steam sterilizer, I also have a formaldehyd sterilizer. On one tray of this I keep all instruments used for root canal work, and when ready to operate, the tray containing the canal instruments are brought to the chair direct from the sterilizer. Here, waiter! Bring a glass of spring water all around, and we will adjourn. It is one o'clock A. M. and I am seven miles from home." (Resolution carried unanimously.)

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National Society Meetings.

AMERICAN INSTITUTE OF DENTAL TEACHERS, Ann Arbor, Mich, January 28-30, 1915.
Secretary, Dr. J. F. Biddle, 517 Arch St., N. S., Pittsburgh, Pa.

PANAMA-PACIFIC DENTAL CONGRESS, San Francisco, Cal., 1915.
Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco, Cal.

The Panama Pacific Dental Congress.

The Committee of Organization of the Panama-Pacific Dental Congress wishes it distinctly understood that the Panama-Pacific International Exposition will not be postponed, but will open on time, as will also the Panama-Pacific Dental Congress.

At the present time matters relating to the Panama-Pacific Dental Congress are most encouraging. The attendance so far as can be judged by those who attended the meeting of the National Dental Association in Rochester, and the meeting of the New Jersey State Dental Society, will break all previous records. Everyone said he was coming, and the Committee of Organization wishes to assure all prospective members that they will be well cared for in every way.

Papers and clinics by some of the most noted members of the dental profession have already been contributed to the program. A large portion of the available exhibit space has been taken by manufacturers and dealers, and the success of this part of the congress is positively assured.

The new Municipal Auditorium in which the congress will be held is being rapidly completed, and will afford facilities for this congress such as no other similar meeting has enjoyed. It is centrally located, and

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may be reached by numerous street car lines from the Exposition Grounds, or any hotel in San Francisco, in from five to twenty minutes.

The San Francisco Hotel Bureau, with offices in the Flannery Building, San Francisco, will look after the reservations for hotel accommodations for our guests. We earnestly advise all those who intend to attend the congress to make their reservations early. Many congresses will be held in San Francisco during the months of August and September, 1915, and many will be in session at the time of the meeting of the Panama-Pacific Dental Congress, and for obvious reasons the reservation of rooms should not be delayed.

Sympathy for Dentists in the War Zone.

Whereas, The members of the Second District Dental Society, of the State of New York have learned with deep interest of the distress and hardships which have been brought to our confrères because of the European war; therefore be it

Resolved, That this society expresses its deepest sympathy for all members of the dental profession, affected by the war, regardless of nationality; and be it further

Resolved, That this society would gladly co-operate in any movement which would in any way alleviate the distress or difficulties of any of those whom we look upon solely as brother workers in a common cause; and be it further

Resolved, That copies of these resolutions be sent to the dental magazines and the associated press, with the request that they be published.

Kings County Dental Society.

The Kings County Dental Society very cordially invites the members of the dental profession to the meeting of this society held on Thursday evening, December 10th, at 8:30 P. M., in the Masonic Temple, Lafayette Ave. and Cleremont Ave., Brooklyn. Dr. Weston A. Price, of Cleveland, will deliver an illustrated talk on "Some Recent Researches and Their Significance to the Dental Profession." The work of the committee, of which Dr. Price is chairman, is of such great practical value that every dentist is urged to make this meeting a very hearty expression of their appreciation of the wonderful accomplishments of Dr. Price.

Dr. Alonzo Milton Nodine, Secretary.

1 West 34th Street, New York City.

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Pennsylvania State Board of Dental Examiners.

The next regular examination of the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh on Wednesday, Thursday, Friday and Saturday, December 9, 10, 11 and 12, 1914. The examination will be held in Musical Fund Hall, 808 Locust Street, Philadelphia, and in the University of Pittsburgh, Pittsburgh. Application blanks can be secured from the Department of Public Instruction, Harrisburg. For other information, address the secretary.

ALEXANDER H. REYNOLDS.

4630 Chester Avenue, Philadelphia.

Idaho State Board of Dental Examiners.

The next meeting of the Idaho State Board of Dental Examiners for the examination of candidates will be held at Boise, Idaho, commencing Monday morning, January 4th, at 9 o'clock. For application blanks and particulars write to

ALBERT A. JESSUP, Secretary.

Box 1414, Boise, Idaho.

Arkansas State Board of Dental Examiners.

The Arkansas State Board of Dental Examiners will hold an examination at the Goldman Hotel in Fort Smith, Arkansas, on December 28th and 29th (Monday and Tuesday). Applications and fees should be in the hands of the Secretary two weeks before the examination.

For further particulars address the Secretary.

I. M. STERNBERG, Secretary.

Fort Smith, Arkansas.

Florida State Dental Society.

At the annual meeting of the Florida State Dental Society, held at Atlantic Beach Hotel, Atlantic Beach, Fla., July 1, 2 and 3, 1914, the following officers were elcted for ensuing year:

W. E. Van Brunt, Tallahassee, president; R. C. McClellan, Ft. Meade, first vice-president; O. R. Cheatham, Jacksonville, second vice-president; A. M. Jackson, Lakeland, recording secretary; Alice P. Butler, Gainesville, corresponding secretary; F. S. Robinson, Jacksonville, treasurer. Executive Committee: Jesse L. Williams, Jacksonville, chairman; W. K. Bradfield, St. Petersburg; A. M. Jackson, Miami; D. B. Morris, Gainesville; M. C. Izler, Ocala.

ALICE P. BUTLER, Cor. Secretary.

Gainesville, Fla.

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Chicago Dental Society.

The annual clinic of the Chicago Dental Society will be held in the Hotel La Salle, January 29 and 30, 1915.

The officers and committees are planning a program for this meeting which they feel sure will be of interest to every dental practitioner who can arrange to be in Chicago at this time.

T. L. GRISAMORE, President.

P. B. D. IDLER, Secretary.

American Medico-Pharmaceutical League.

Signatures to Subscriptions.

A regular monthly meeting of the executive committee of the American Medico-Pharmaceutical League occurred on the evening of September 28, 1914, at 451 Forty-seventh Street, Brooklyn, N. Y.

After the election of new members, Dr. Brothers, the corresponding secretary, announced that he took pleasure in reporting that 331 (three hundred and thirty-one) new members, had been elected in the past seventeen months.

The following letter from the New York State Department of Health was read and filed:

(*Brooklyn Eagle,* September 29, 1914)

"In reply to your letter of September 12th, regarding the interpretation of the Boylan law, I beg to state that this department has held, that the signature of a physician upon every prescription calling for the drugs whose use is restricted by this act, shall be signed with the Christian or first name in full, the initial of the middle names, if there be any, and the surname in full—for example, a doctor named John David Smith, should sign John D. Smith, not simply J. D. Smith. Any prescription must necessarily state the name and amount of each ingredient called for therein. The druggist is required to write upon his prescription the name and address of the purchaser actually making the purchase, and the date upon which sale is made. Before the enaction of this law, it was provided by Section 237 of the public health law that a drug is misbranded if the package fails to bear a statement of the percentage contained therein by volume of alcohol, and by quantity or proportion, of morphine, opium, heroin, chloroform, chloral hydrate, acetanilid, cannabis indica, or any derivative or preparation of any of these substances. This provision is in no way repealed or superseded by the Boylan law, and by this provision misbranding is made a misdemeanor."

SAMUEL F. BROTHERS, M.D., Cor. Secretary.

96 New Jersey Ave., Brooklyn, N. Y.

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Association of Military Dental Surgeons.

The following officers of the Association of Military Dental Surgeons were elected for the coming year:

Dr. Wm. C. Fisher, president, 373 Fifth Avenue, New York City; Dr. John D. Milliken, 1st vice-president, San Francisco, Cal.; Dr. Wm. H. Ware, 2d vice-president, San Francisco, Cal.; Dr. Chas. J. Long, secretary, Rock Island, Ill.; Dr. R. W. Waddell, treasurer, New York City.

Indiana State Dental Association.

The next annual meeting of the Indiana State Dental Association will be held on the 18th, 19th, 20th of May, 1915. A distinctive feature of this meeting will be that the program will be made up exclusively of Indiana dentists. A cordial invitation is extended to members of other dental societies to attend the meeting.

A. R. Ross, Secretary.

Lafayette, Indiana.

Montana State Board of Dental Examiners.

The Montana State Board of Examiners will hold a session on the second Monday in January, 1915.

Butte, Montana.

Dr. G. A. Chevigny, Secretary.

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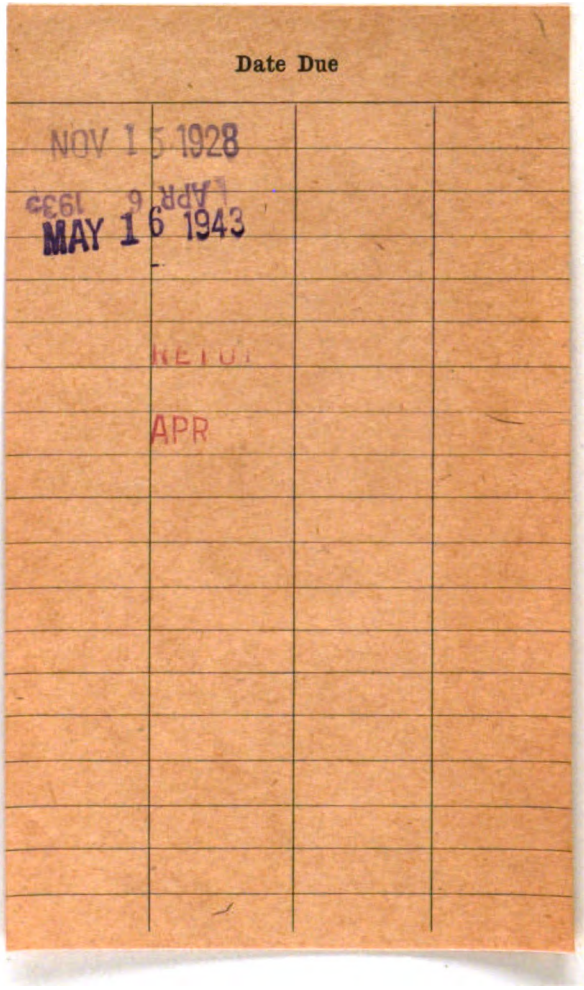
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